Mapping of Urban Health Facilities in Maharashtra

Anandi Dantas

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Centre for Enquiry Into Health And Allied Themes

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Preface

The current development pattern is increasing the shift of population from metro cities to small cities and towns. There is a dearth of information on health services and health status of those living there. There has been little research on the growth of health services in these towns. Maharashtra is the second most urbanised state in India with 42% of its population residing in urban areas. Over the years, the growth in public health sector has not kept pace with the growth in increase of urban population. The present study examined the spatial growth of public and registered private health facilities in selected cities of Maharashtra. The mapping method used in the study has been really useful in highlighting the availability of private/public facilities in these cities. We found clusters of private hospitals in the city centres, with the urban poor completely excluded. The private health sector has been growing without any kind of regulation. Unlike education where schools cannot be set up in an area where a school already exists, the health sector does not have any such norms. The growth of private hospitals is determined not by need but by the market, thus leading to high concentration zones within the city. The study highlights an urgent need for a norm for location / distribution of private hospitals within the city to facilitate a more equitable distribution of health services.

The use of Geographical Information System (GIS) in the field of health research is increasingly becoming important. GIS can be effectively used as locational technique for analysis for decision making in relation to optimum gainful utilization of available medical resources. Having embarked on the use of geographical method for health research, it prompted us to organize a seminar in collaboration with the Department of Geography; University of Mumbai titled "Spatial Dimensions on health care-Use of GIS in health studies". The aim of this seminar was to discuss the prospects and future development of GIS in spatial health and health care management. Six papers were presented at the seminar from use of GIS for mapping HIV/AIDS facilities in Maharashtra to effective management of sanitation facilities in Chennai slums to using it in post flood epidemic in Mumbai. The findings from the CEHAT study too were presented. A paper reflecting on concepts and relevant techniques in health was presented too followed by a panel discussion on future prospects of GIS in health studies.

We are hopeful that the findings of the study would be useful in making key recommendations for regulation of private sector, especially for equalizing accessibility/distribution of private establishments. The methodology could be used for other states experiencing rapid growth in urban centres.

I am grateful to the PDC members: Padmini Swaminathan, Padma Prakash, Lakshmi Lingam and Vibhuti Patel for their feedback and guidance at various stages of this project.

Padma Bhate-Deosthali
Coordinator, CEHAT

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I also want to express my gratitude to Dr. N. Padalkar, Dr. Shinde and Afroz from the Aurangabad Municipal Corporation RCH Department, Dr. Adke RCH Officer from the Solapur Municipal Corporation and Najia Rizvi from RCH Department from the Nagpur Municipal Corporation. Special thanks are also due to all the key informants for their informative comments about the growth of health facilities in the four cities in the study.

I thank Oommen Kurian and Prashant Raymus from CEHAT for their useful comments and Dr. Ram Bhagat, Professor and Head of Department of Migration and Urban Studies, International Institute of Population Sciences, Mumbai, for his review.

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Introduction

Urbanization has brought major changes all over the world, especially in developing countries. It brings about fundamental changes in the way people live, in the quality of life, changes in the environment and much more. These changes have profound implications, both positive and negative, for health and the health rights of urban residents (Singh 2005).

One of the major concerns in urbanization is the rapid growth of the urban population living in cities. More than half of the world's population is living in cities. The world's urban population growth rate is 1.8 percent as compared to the world's population growth rate of 1 percent. In developing countries such as India, the urban population growth rate is much higher. Nearly 27.8 percent (285.4 million) live in urban areas as of 2001. During the decade, 1991-2001, the urban population grew by 31.2 percent, while the rural population grew by 17.9 percent. By 2030, India's population is estimated to grow to 538 million, with more than half of its population living in cities. India had an average annual population growth rate of 2 percent, while the urban population grew at 3 percent. Alongside there has been the rapid growth of slums in urban areas, at a rate of nearly 5-6 percent per annum. The slums are characterized by overcrowded living conditions, unhygienic environment, lack of clean drinking water and lack of sewage and garbage disposal systems. Lack of civic facilities coupled with inadequate primary health care services in most of the urban areas has had an adverse impact on the health of the residents.

Studies have shown that just by living in urban areas that are endowed with better health infrastructure than the rural areas may not mean that the population can access these services and improve their health status. Most of the country's curative and hospital services are located in cities. The country has a dominant private health care and a declining public health sector (Duggal 2005: 228). Nearly 70 percent of the hospitals and 85 percent of the hospital beds under the public domain are located in urban metropolitan areas. The private health sector scenario is similar, with 60 percent of the hospitals, 75 percent of the hospital beds and 70 percent of allopathic doctors located in urban areas. But this has not led to an improved health status for the residents. Declining public health care adds to the burden of the poor living in urban areas (Duggal 2009).

Health indicators of the urban poor in India and the states, such as child, infant and neonatal mortality are very high. The child mortality rate is 101.3 for the urban poor, 63.1 is the urban average and the rural average is 103.7 per 1000. The infant mortality rate is 66, 47 and 73.3 for the urban poor, urban average and rural average respectively. Neonatal mortality is 39.1, 31.7 and 46.7 for the urban poor, urban average and rural average respectively. There is a high incidence of under nutrition among the urban poor. Nearly 56.8 percent of the urban poor are malnourished, the rural average is 49.6 percent and the urban average is 38.4 percent in the age group 0-3 years (Agarwal and Satyavada et al 2007).

The urban average is masking the urban poor status. There is poor access and utilization to reproductive and child health among the urban poor. Essential public services in urban areas have remained inaccessible due to physical distance and affordability. Illegality and invisibility of some slums excludes them from basic preventive health coverage by the government and this may affect the city's health indicators. Slum dwellers in the city are affected due to insufficient services, low awareness and poor environment. The lack of political will, timing of public facilities, lack of outreach, unfriendly

environment in government facilities, all lead to less use of public services. (Agarwal and Satyavada et al 2007). The lack of establishment of new Urban Health Posts (UHPs) in urban areas also contributes to poor health indicators (Agarwal et al 2005). UHPs primarily cater to the urban poor, but are not able to cover the entire urban population. It has been reported that within cities, there are several pockets which have no government facilities (John et al 2008). The health of the urban poor has been worse off than the health of the rest of the urban population. In many cases, the health of the urban poor is the same or worse off than even their rural counterparts (Agarwal and Satyavada et al 2007). In India, technology has driven the growth of the health delivery system, rather than epidemiology or geographic realities. This has impacted access to health care across states, rural-urban divide in health delivery and led to variations in the access to primary health care and health manpower. This has resulted in the haphazard growth of the private sector. This sector has played a major part in health delivery, especially in urban areas and has created a highly unregulated health market with unequal access to healthcare services. At the same time, the role of the state as a provider of healthcare has been shrinking rapidly (Rao 2005). This is evident in the provision and growth of public health facilities in the urban areas of 'million' cities and in medium sized cities.

The increasing concentration of population in 'million' cities gives an impression that these cities are growing faster compared to medium and small urban centres/cities. This, however, is not true (Government of India 2007 in 'The state of population').

The Government has mostly focused on the needs of metropolitan cities, - Mumbai, Delhi, Kolkata and Chennai. There are calls to focus health programs in mid-sized cities as well. The National Urban Health Mission (NUHM) envisages more migration from rural areas to the mid-sized cities and these are projected to join the ranks of 'million' cities in the next two decades (Agarwal et al. 2005). Most of the government's programs have focused on rural health as India has been predominantly rural in the past. Urban growth has been rapid during the last three decades both in the country and in the state of Maharashtra. There has been an accelerated growth of city size and large scale migration to the cities of semi skilled labour. This has led to an increase in the urban poor in the cities, yet there has been no major policy focus to address their health issues (Agarwal and Srivastava et al 2007). There is also a lack of data and research about the urban poor in terms of their access to health facilities in urban areas.

Urbanization in Maharashtra

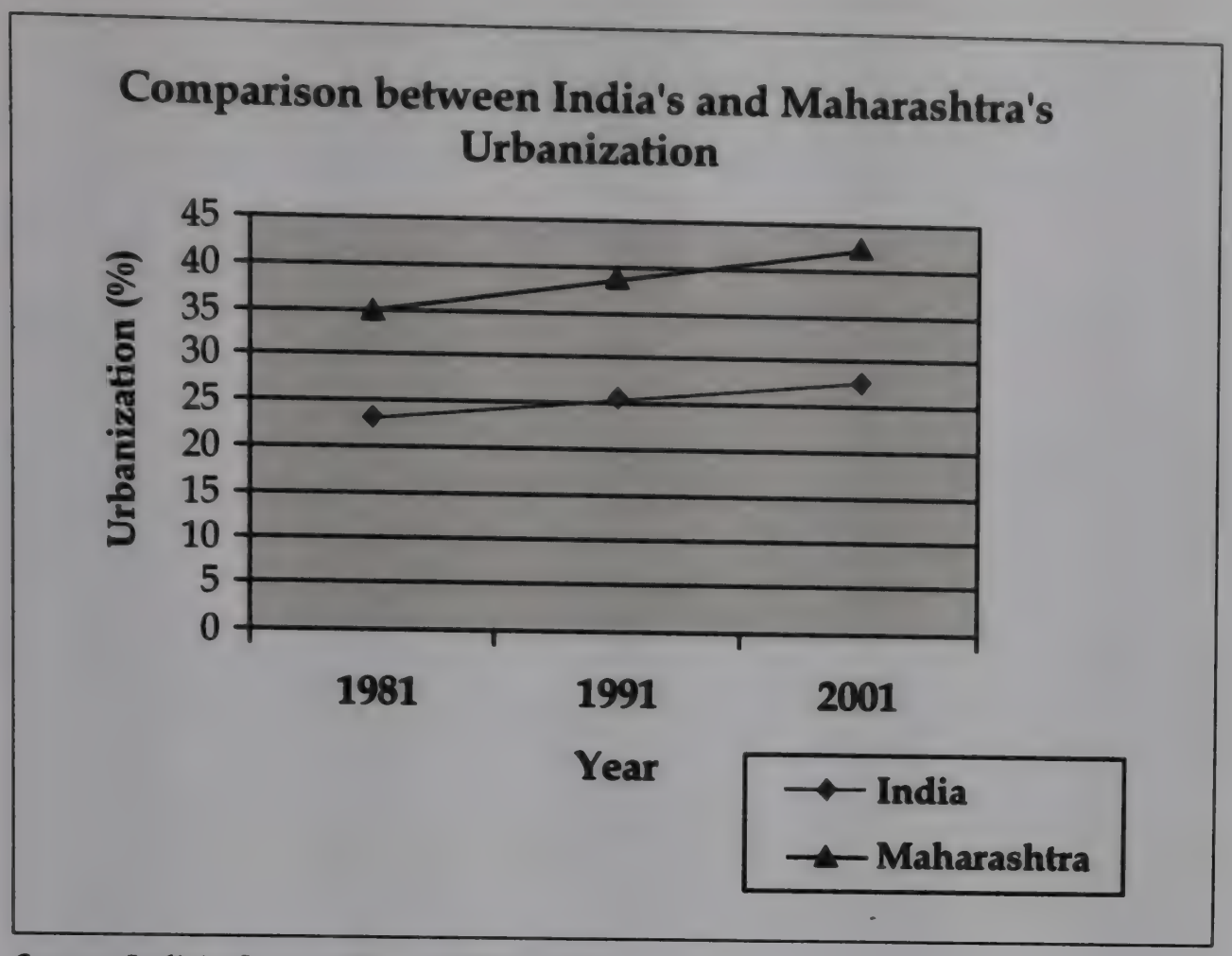
During the last three decades the percent of urbanization in Maharashtra was higher than that of India (Graph). Maharashtra is the second most urbanized state in India The urban population comprising 42.4 percent (Table 1) of the state's population is expected to increase one and half times by 2026 (rhm-mis.nic.in/UI/...? Population_Projection_Report_2006.pdf).

Of the urban population, 27 percent or 10.6 million were classified as the urban poor, that is, 1 percent of India's total population. Maharashtra has the highest number of urban poor in India (Urban Poverty Report 2009). Between 1977 and 2000, the percentage of urban poor in Maharashtra grew from 24 percent to 45 percent (State Planning Division, Maharashtra State Development Report, chapter 13 2005 and http://uhrc.in/downloads/Presentations/MNH_Scenario_Maha_Sawangi.pdf)

Urbanization trends in Maharashtra during 1901-2001 presented in Table 2 reveal the rapid growth of Class I cities[1].

[1] Census of India Classification:
Class I:100,000+, Class II:50,000 to 99,999; Class III:20,000 to 49,999; Class IV: 10,000 to 19,999; ClassV: 5000 to 9,999; ClassVI:less than 5,000

Graph 1



Source: India's figures-Bhagat (2005 : 6)
Maharashtra: Doifode et al. (2007: 176)

Table 1: Urbanization Trends in Maharashtra

	Urbanization in Maharashtra		
	1981	**1991**	**2001**
Urbanization percent	35.03	38.73	42.48
State population	63 m	79 m	96 m
Urban Population	22 m	30 m	41 m
Number of Towns	307	336	347
% share India's Urban Population	13.77	14.04	14.36

Source: Government of India (2007),' The State of Population 2007'

In 1991 and 2001 Class I, II and III cities contributed to nearly 95 percent of the urban population of the state. The share of Class I cities was 77.83 percent in 1991 and 79.70 in 2001. The percentage of population in Class II cities also increased, but the others decreased (Doifode and Kamble 2007). The rapid growth of Class I cities, which have almost 80 percent of Maharashtra's urban population, will have an adverse impact on the cities' infrastructure-- urban housing, civic amenities, education and healthcare.

Table 2: Urbanization Trends in Maharashtra

Census year	Total no. UAs/ Towns	Total Urban Population	Percent Urban Population
1901	214	3217202	16.59
1911	225	3248989	15.13
1921	234	3857326	18.5
1931	247	4456730	18.6
1941	247	5665111	21.11
1951	373	9201013	28.75
1961	239	11162561	28.22
1971	257	15711211	31.17
1981	276	21993594	35.03
1991	291	30541586	38.69
2001	347	41019734	42.4

Source: Table 10.1, pp. 176 Doifode et al 2007.

It is therefore important to examine the rapidly expanding urban areas of Maharashtra, particularly the Class I cities, and the need for development of health facilities, so as to meet the health needs of the growing urban and urban poor/slum population.

Top ten ranked cities of Maharashtra by Population Size

The top ten cities of Maharashtra by population size are given below (Table 3) along with their populations:

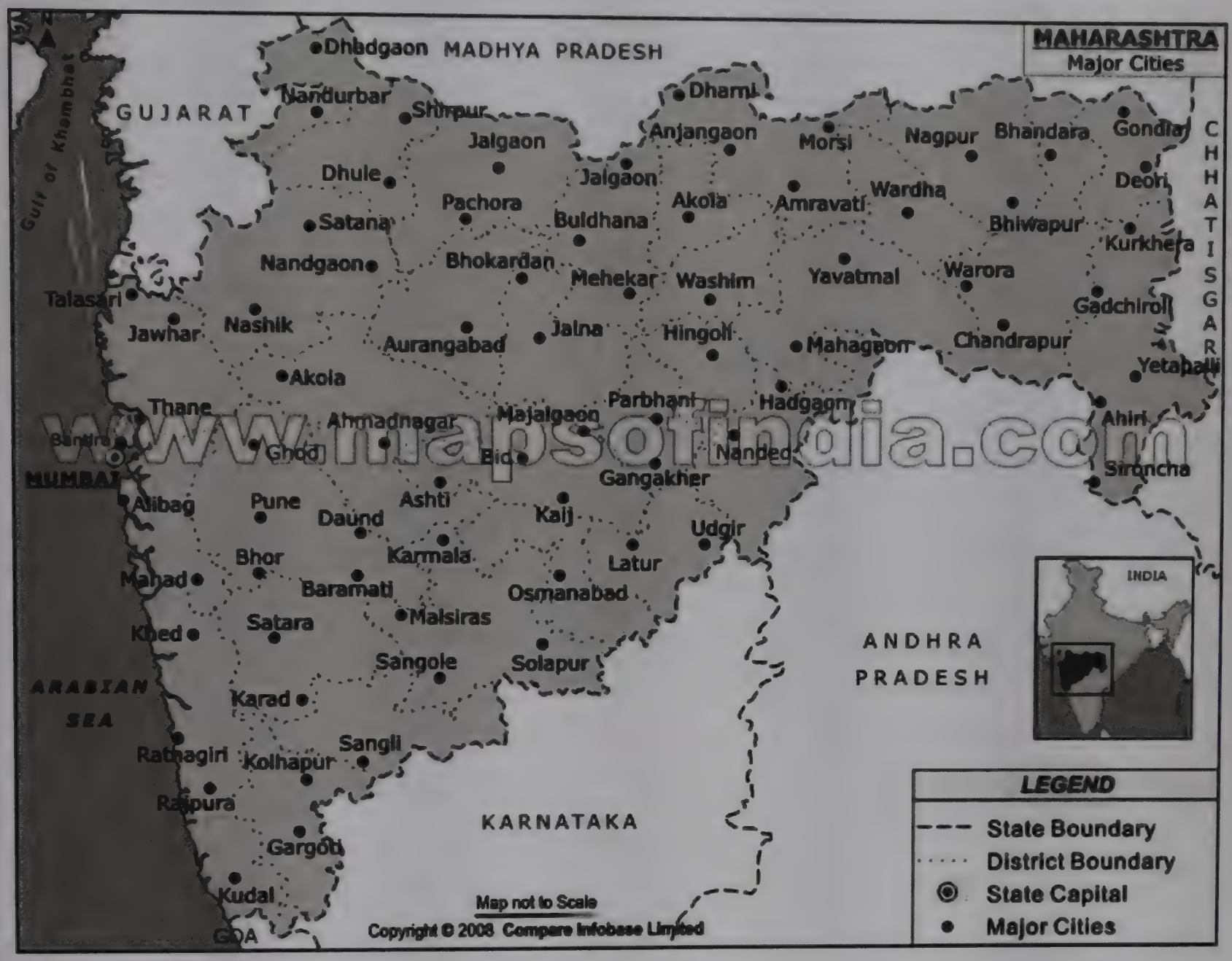
Table 3: Top Ten Cities of Maharashtra-by Population

Rank	City Name	Population 2001 (Municipal Corporation)
1	Mumbai	11,914,398
2	Pune	2,540,069
3	Nagpur	2,051,320
4	Thane	1,261,517
5	Kalyan-Dombivli	1,193,266
6	Nashik	1,076,967
7	Pimpri-Chinchwad	1,006,417
8	Solapur	873,037
9	Aurangabad	872,667
10	Navi Mumbai	703,947

Source: Census of India 2001. Series 28, Maharashtra: 17 (Provisional Population figures)

The above table shows the urban population of the first ten cities ranked by population size. Mumbai urban agglomeration area includes Mumbai city and its satellite towns of Thane, Kalyan-Dombivli and Navi Mumbai. Pune's satellite includes Pimpri-Chinchwad. Other cities with a rapid urban population growth outside the Mumbai-Pune urban sphere are Nagpur, Nashik, Aurangabad and Solapur and these will be the area of study for mapping urban facilities growth.

Map of the Study Area



Source: Maps of India (www.mapsofindia.com/maps/maharashtra)

Study Design and Methodology

Statement of the Problem

Though there have been a large number of studies on urban health in Maharashtra, there are few that have graphically mapped the temporal and spatial growth of health delivery systems within the urban areas in relation to population growth,examined the spatial growth and pattern of health facilities at the intra-city ward level and the possible processes at work.

Objectives of the Study

1. To map the growth of public and registered private facilities in urban Maharashtra with reference to the select cities of Aurangabad, Nashik, Solapur and Nagpur from 1991 to 2009/2010.
2. To compare the growth of health facilities to the growth of population and slum population in the select cities.

Rationale of the Study

The urban population has been growing at an exponential rate in Class I cities in Maharashtra (Tables 1 and 2). The concentration of healthcare provision is top heavy, they are mainly located in mega cities like Mumbai (Agarwal et al. 2005). There has been less focus on the next level of cities which have been growing rapidly. While the rural-urban divide in health infrastructure is known, there has been little research on the health infrastructure of the middle level cities, whose population has been growing rapidly.

Methodology

For mapping and to measure spatial accessibility of health facilities, secondary information of public and registered private health facilities were collected from the municipal corporations of the four cities, Aurangabad, Nashik, Solapur and Nagpur [2]. The addresses and the date of establishment/registration date of the facilities were collected. The data for Aurangabad was obtained in 2009 and 2010, for Nashik in 2009, while Solapur and Nagpur data were collected in 2010. Population and slum population figures were obtained from the Census of India and also from the respective municipal corporations of the four cities. Using these data, provider to population ratios, also known as the supply ratios were computed as a measure of spatial accessibility (Guagliardo 2004).

An Electoral Ward (EW) map of the city was used to locate the health facilities for each city. The map was scanned and AutoCAD software was used to create EW boundaries. The city map with major roads and landmarks were referred, using the Google map on the internet. The electoral ward map of 2005, with detailed area description was used to find the approximate location of the health facilities in the respective electoral wards of the city. The hospitals were located with the help of yellow pages

[2] This included Bombay Nursing Home Registration Act (BNHRA) and Pre-Natal Diagnostic Act (PNDT) lists. This registration began in 1994 in Aurangabad and in 1996 in Nashik.

and supplemented by the all India hospital list available on the internet. This was examined by looking at the growth of the population in the city and the growth in the number of facilities for the two decadal years of 1991 and 2001, and mapped for 1991, 1994/1996, 2001 and 2009/2010 using PhotoShop software.

EW was found to be relevant as a geographic unit of analysis for mapping as compared to city census wards, as census wards have not been defined either by area names or by a census ward map at the city level.

Mapping as Methodology

Mapping is a visual representation of data. It shows the spatial distribution of a particular phenomenon that the researcher is interested in. It is far easier on the eye and the mind to read a map rather than to read a description of the same or run through a table; in fact, a map says it all in a glance. Mapping enhances our spatial sense and gives a better sense of place. Density of a phenomenon can be captured better in a map than from a table. Maps can be used for analysis and interpretation. For example, when we see a concentration of hospitals in a part of city, we would like to know the reason for it. When we superimpose this concentration with road connectivity and location of industries, it may explain the reason for this concentration. It can lead us to uncover the underlying processes that have led to the growth of the facilities in that area. Running a series of maps of the growth of a phenomenon can show the areas where most of the growth (and possibly socio-economic changes in the population) has taken place.

Using maps as a method to analyze health facility growth has certain advantages that are not available in social science research methods. The concept of 'space' is explicit in cartography and mapping techniques. The changes over space can be seen clearly as we do a temporal analysis, of say, the availability of health facility locations over the years. These changes can be easily visualized and correlated with other physical and manmade features such as transport network, nearby towns, other health facilities, location of higher or lower income residences nearby, industries and other factors that may have influenced health facility growth in the areas within a city. Spatial access for specific groups of people can be estimated by looking at the maps and areas of need can be easily identified and targeted for future growth. Space is also an integral part of this study as it is concerned with the issue of accessibility, which is likely to have an impact on the health indicators of the city.

Finally, key informant interviews were done from municipal and civil society so as to get a complete picture of the processes that may have shaped the present spatial pattern of the health facilities in the four select cities. The key informants were selected based on their years of expertise/designation in the field of health and their years of residence in the city. Twelve key informants were interviewed, three from each city, with one from municipality and two from civil society.

Limitations and Problems of the Study

1. Non availability of census city ward maps for which the census report has city census ward wise detailed data.
2. Non availability of detailed slum population data.
3. Non availability of slum/non slum mortality/birth/morbidity data (except for Nagpur from NFHS-3 survey). Only city level data was available to derive health indicators.
4. Under reporting of registered private facility data in municipal corporations, actual number of health facilities may be more.

5. Nashik municipal data of private registered 'facilities'[3] not updated
6. Discrepancies in the date of registration of private health facilities; the date of establishment may be different than that shown in the data.
7. Difficulty in finding the location of each health facility in the specific EW; it took almost 5-6 months.
8. Lack of uniformity of recording data in municipal corporations across the state.
9. Growth of population and growth of health facilities may not be directly comparable but gives us an indicator of growth.
10. The paper examines the availability and accessibility of health facilities, not affordability or quality.

[3] Nashik private facilities list obtained from the Nashik Municipal Corporation is not updated. It includes hospitals, maternity homes and private practitioners. This information has been corroborated in a recent communication (February 2011) with Dr. Shyam Ashtekar, former Director of School of Health Sciences, Yashwantrao Chavan Maharashtra Open University, Nashik. According to him there were 679 hospitals in Nashik in 2010.

Population and Growth of the Slum Population

India's population growth has a trend known as the 2-3-4-5 syndrome. The country grew at an average annual growth rate of 2 percent, urban population grew at 3 percent, the mega cities grew at 4 percent and the slum population grew 5-6 percent (Agalwal et al 2005). It will be a useful exercise to estimate the growth of the slum population in the four cities and its consequence on the supply ratios.

Population growth rate for all the four cities are found to be declining (Table 4). The fastest growing city in 2008 is Aurangabad, and not Nashik. Solapur is growing at a lesser pace than Nagpur, as it was the third fastest growing city 1991-2001 among the top 10 ranked cities of Maharashtra.

Relevant population details and rates are presented in Tables 4-6.

Table 4: Population Figures for the Four Cities

City	Population 1991 (census)	Population 2001 (census)	Population growth rate (%)	Mid year population 2008 (Mun. Corp. Data)	Population growth rate (2001-2008) In % (for 7 years/10 years)
Aurangabad	573272	873311	52.34	1172000	34.20/48.85
Nashik*	656925	1077236	63.98	1369754	27.15/45.25
Solapur	604215	872478	40.53	993615	13.88/19.83
Nagpur	1624752	2052066	26.30	2364137	15.21/21.73

**2007 mid -year population, growth rate adjusted accordingly*

Table 5: Slum Population Figures

City	Slum Population 1991 (census)	Slum Population 2001 (census)	Slum Population growth rate (1991-2001, %)	Slum Population 2008 (Mun. Corp. Data)	Slum Population growth rate (2001-2008 in %)
Aurangabad	100843	147776	46.54	243650	64.88
Nashik	66938	138797	107.35	186117	34.09
Solapur	152350	180882	18.73	360000	99.02
Nagpur	472865	737219	55.90	858983	16.52

AMC figures for slum population of 2008 for Aurangabad
Nashik slum totals are for 2007
SMC slum figures for 2008 for Solapur
CHF International, Nagpur Municipal Corporation and ESAF slum figures, Nagpur 2008

Table 6: Slum Population as a Percentage of the City Population

City	Population 1991	% Slum Population 1991	Population 2001 (census	% Slum Population 2001	Mid year population 2008	% Slum Population 2008
Aurangabad	573272	17.59	873311	16.92	1172000	20.79
Nashik	656925	10.19	1077236	12.88	1369754*	13.59
Solapur	604215	25.21	872478	20.73	993615	36.62
Nagpur	1624752	29.10	2052066	35.93	2364137	36.33

**2007 figures. 1991 slum population was approximate according to the 1991 census*

Table 7: Population and Slum Projection and Growth Rate 2001-2011

Population Growth	Population 2001	Population 2007	Population 2008	Projected Population 2009	Projected Population 2010	Projected Population 2011	Population Growth Rate 2001-2011
Aurangabad	873311		1172000	1229252	1289301	1352284	54.84
Nashik	1077236	1369754	1431735	1496521	1564239	1635020	51.78
Solapur	872478		993615	1013318	1033412	1053905	20.79
Nagpur	2052066		2364137	2415510	2467999	2521628	22.88

Nashik Population projected for 2008, Population projected using the growth rate from Table 4

Slum Population Growth	Slum Population 2001	Slum Population 2007	Slum Population 2008	Slum Projected Population 2009	Slum Projected Population 2010	Slum Projected Population 2011	Slum Population Growth Rate 2001-2011
Aurangabad	147776		243650	250886	258338	266010	80.00
Nashik	138797	186117	189729	193412	197166	200993	44.81
Solapur	180882		360000	378832	398648	419502	131.92
Nagpur	737219		858983	903564	950459	999788	35.62

There is a tremendous growth in the slum population from 1991 to 2008 as seen in Tables 5 and 7. Compared to the population growth rate, the slum population in Aurangabad and Solapur are growing much faster. The growth rate was 64.88 percent for Aurangabad and 99.02 percent for Solapur 2001-2008. Table 7 shows the projected slum growth rate from 2001-2011. Its shows an astounding slum growth rate for Solapur (131.92%) and for Aurangabad (80%). The proportion of urban poor is rising in all the four cities (Tables 6 and 7). Only in Nashik, the slum population grew at a lesser rate than the population growth rate.

Select Cities - An Analysis

Aurangabad

Aurangabad city had a population of 573272 in 1991 and 873311 in 2001 (Census of India 1991 and 2001). The population and slum growth is described in Tables 4-7.

During 2001-2011, the population growth rate of the city has overtaken that of Nashik. There were 98 EWs in 2005. The slums are located primarily in the eastern electoral ward of Chikalthana and Naregaon and along the highway from the airport towards the city and this is also where most of the migrants have settled. Migrants, who settled in the city in these places after the 1971 drought, are from the nearby towns of Parbani, Jalna and Hingoli. They settled primarily near the main roads, in and near Chikalthana area, Sanjay Nagar and Mukundwadi EWs. In the east, the slums are connected to Maharashtra Industrial Development Corporation (MIDC). Migrants have also settled in EW 2. There are slums in Nehrunagar (EW 28). Pundliknagar (EW 83) has a large number of migrants (hawkers and service providers of lower economic status). Migrants have also settled in this ward. Ramanagar (EW 65) has a slum population mainly comprising construction labour, drivers and hawkers. Besides, there are slums in the south western part of the city at Kabirnagar (EW 92), Padampura (EW 95) and Hamakwada Railway Station (EW 96). The EWs with a higher slum population are shown in Map 4.

There has been considerable migration to Aurangabad, a city with high industrial growth, because of which, there are both skilled and unskilled workers in MIDC. Another reason for migration to the city is the existence of a large number of educational institutions. Besides, post retirement, people prefer to settle in Aurangabad after Pune[4].

Health indicators for the city are shown in Table 8. All the three indicators show an increase from 2006-2008. These indicators are only for three years, yet this increase may be due to growing migration, increasing slum and floating slum population in the city. Aurangabad reported about 49 percent of its slum population living in the undeclared slums in 2008 as reported by the Aurangabad Municipal Corporation (AMC). The high percentage of people living in undeclared slums increases the chances of children not receiving preventive health measures that are provided by the government. This will in turn affect the health indicators for the city.

[4] Migration and slum location data from Project Director of a NGO who has been working with city migrants/ HIV population for over 10 years and from an AMC health official in the field for over 20 years

Table 8: Health Indicators for Aurangabad City

Year	2005-06 India[1]	2006/07 Maha. State[2]	2006/07 Maha. Urban[2]	2006 Auran. City[3]	2007 Auran. City[3]	2008 Auran. City[3]
CBR	23.8	18.5/18.1	17.5/17.3	24.71	28.48	37.44
CDR	7.6	6.7/6.6	5.8/5.7	5.79	4.85	7.49
IMR	57	35/24	26/24	19.20	13.51	23.39

Source: basic data from Aurangabad Municipal Corporation of number of births, deaths, deaths of infants below 1 year and mid year population for these years

[1]WHO report on basic health indicators
[2]Maharashtra rates from SRS Bulletin 2006 & 2007
[3]Calculated per 1000 for Aurangabad by the author

Public and Private Health Facilities

Public and private health facility ratios are shown in Table 9

Table 9: Ratios Public and Private Facilities 1991-2010 for Aurangabad

Facilities	1991	1994*	2001	2010*
UHP/HC	1: 81896	1: 66808	1: 43,666	1: 61396
Public Hospitals	1: 191091	1: 222693	1: 218328	1: 161166
Beds[5]	NA	NA	NA	1: 1069
Private Hospitals	NA	1: 6817	1: 4746	1: 3215
Beds	NA	NA	NA	1: 395

**Using projected population (ratio: population/number of facilities)*
NA: data not available

The ratios give an approximate index of the accessibility that the population has to health facilities. An improving ratio shows an increase in the availability of facilities. As the UHPs in 2010 have been located in three different parts of the city, this may make the facilities more geographically accessible to the surrounding population. It would be of interest to compare facility-population ratios for the cities to the rural healthcare population threshold norms. In India, the rural public health facility structure is well organized with clear cut population threshold norms. It has a three tier system. The CHC population norm is 1: 80,000/1.2 lakhs, the PHC norm is 1: 30,000 for the general population. Below PHC are sub-centres with 1: 5000 (Duggal, et. al. 2005). The UHP, which is comparable to PHC, has ratios well over 30,000 for all the years in Aurangabad, yet there is an increase in the availability and accessibility of the facility from 1991 to 2010.

[5] Countries in a comparable economic development level like China, Thailand and others have a bed ratio of 4.3 beds per 1000 population, while for India the ratio was 1.03 per 1000 in 2006 (Ministry of Health and Family Welfare 2011). India has a disease burden of 20 percent of the world's and has only 6 percent of beds (www. ficci-heal2008.com)

Public Facilities

UHP had a growth rate of 186 percent (from 7 UHPs in 1991 to 20 HC in 2001). The 2010 ratios show a worsening scenario for UHP, as only one UHP was added between 2001 and 2010. The UHPs provide preventive care such as immunization and nutrition services, particularly to the slum/poor population, and therefore their growth rate is of interest in this study.

Three UHPs were located in the city centre in 1991. The outlying UHPs were in Chikalthana (EW 78), Harshul (EW 1) and Bhavsingpura (EW 7). Chikalthana, once a village, has grown because of a sizable slum population[6]. There was one UHP located at Krantichowk in the south western part of the city. In 2001, three UHPs were located in the older parts of the city in the north and northwest, one at the city centre and one at Mukundwadi which has a sizable slum population. Three were located in the south western part of the city. Four new UHPs located 2001-2010 have been located in wards that do not show a large number of slums within, but in a ward close by. Two were located closer to the city centre and two UHPs were located in the south-western part of the city close to the wards with a slum population. The location of UHPs outside the slum areas will reduce their accessibility to the slum residences. Similar findings have been reported elsewhere (Nadkarni et al 2009).

Of the 17 EWs with the highest reported concentration of slums (Map 4), five of the wards had a UHP located in its precinct. The UHPs were mainly concentrated close to the city centre, though there are a few beyond that. The eastern part of the city, Chikalthana and Naregaon, has a large number of slums, yet there is only one UHP here. Also, the western EWs have only one UHP at Bhavsingpura (ward 7) though a number of wards close by have a slum population. There are a number of EWs with a growing migrant population with no UHP close by and many of these wards may have undeclared slums that are outside the purview of the government's preventive health care. This is likely to increase the urban health indicators for the city, besides those of the slum/urban poor. As the slum growth is expected to be 80 percent from 2001-2011 (Table 7) and growing faster than the total population rate for the city, one can expect the health indicators for the urban poor to worsen. Accessibility to government facilities is minimal for the undeclared slum population as noted by Agarwal et al. (2005). Increasing the number of UHPs in the city will improve the accessibility for the declared slums. It may be necessary to undertake targeted intervention in preventive health service for the slums that are outside the purview of the official list.

Public Hospitals (PH) had a growth rate of 33 per cent (from 3 PH in 1991 to 4 PH in 2001). There is a marginal improvement in the ratios of PH even though the number of hospitals has doubled by 2010. Two of the older public hospitals are located in the north western part of Aurangabad, and one at MIDC Chikalthana in the eastern part of the city. Of the newer locations post 1991, one is in Yadavnagar in the northern part of the city, two are near the city centre and two in the southwestern wards of the city. None of the PHs are located in wards that have a high slum population.

Of the 8 public hospitals, 5 hospitals are run by the Municipal Corporation and are maternity focussed and provide very little curative care for other health problems. Each Municipal Corporation hospital has 24 bed facilities, of which 20 beds are used for maternity and family planning and only 4 beds are available for general patients (Aurangabad Municipal Corporation 2010). This setup in municipal hospitals makes it difficult for the poor in Aurangabad to avail themselves of general curative services.

Map 1 shows the 1991 UHP/HC and PH facility locations. There was only 7 UHP/HC and 3 PH. Most of the city is not served adequately[7]. Only one major secondary and tertiary level facility was the

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[6] Source: same as footnote 4

[7] It should be noted that the city limits were smaller in 1991, ie less EW and population

Government Teaching Hospital located in Bhadkalgate. In 1994, there were 10 UHP/HC, one of these being located in the outlying area of Naregoan, and the other two close to the central area of the city where the density of population was higher. The public facilities of UHP/HC and PH have spatially expanded towards the peripheral wards of the city, especially in the western side of the city (Maps 1-4).

Private Health Facilities

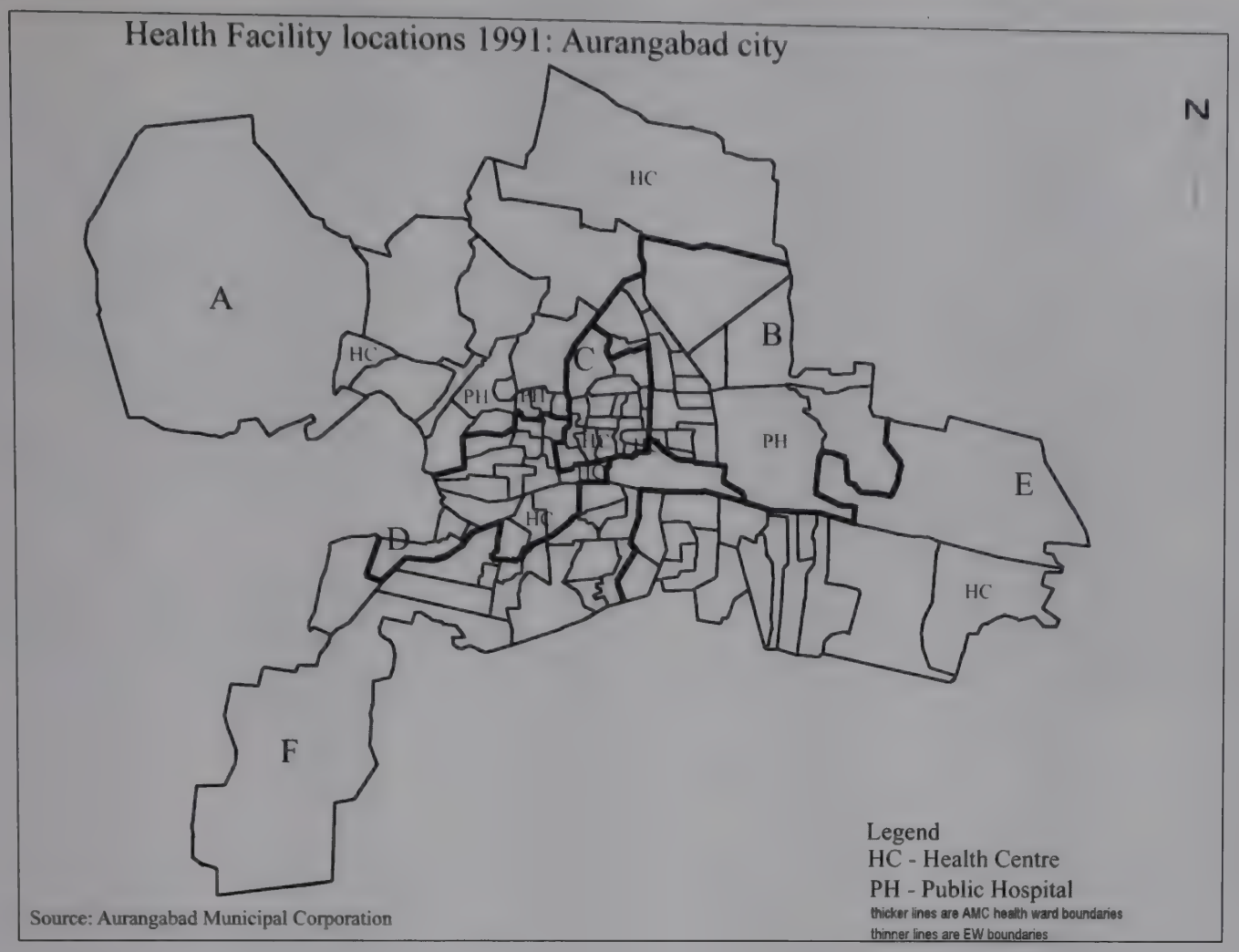
Registered private hospitals had a growth rate of almost 88 per cent (98 private hospitals in 1994 to 184 private hospitals in 2001. Compared to the public facility ratios, the private facility ratios are much better. This is due to the spurt in the growth of private facilities in the city. The private hospitals in Aurangabad are specialized and provide a wide variety of curative medical care. The city has 142 maternity homes. The public and private healthcare mainly caters to maternal healthcare, with over 90 percent of the private hospitals registered under both BNHRA and PNDT Acts (the city has a very high CBR). There is less emphasis on other healthcare, which in turn implies that the lower economic status population in the city may be at the mercy of unqualified medical practitioners and private services. This has proved to be the case in Aurangabad as the city abounds with a large number of unqualified medical practitioners and centres providing alternative medicine, such as electropathy and naturopathy, run by those who graduate from colleges in neighbouring towns such as Sillod and Jalna[8].

At the ward level, there are three areas of private facility concentration[9]. The first area is Samarthnagar in the central western part of the city. This ward and the surrounding wards have a high number of private hospitals and associated facilities of Ultra Sonography (USG) and Family Planning (FP) surgery centres. This ward had 34 private hospitals in 2010. The concentration is mainly due to the higher income population residing in the area. Hospitals were set up here to serve this population. Later, locations of private hospitals were influenced by this earlier location. The area also has good road connectivity as Highway 211 goes through the area connecting the nearby towns. The second area of private hospital concentration is on either side of 211 Highway, close to MGM Trust Hospital. This concentration has been also influenced by the nearby market. The third area is Yadavnagar in the northern part of the city. The density of hospitals here is primarily due to good road connectivity to Jalgaon and adjoining areas to the north of the city. Over 31 percent of EWs remain without a registered private facility (Tables and Ward Graph in Appendix). This is mainly in the southern and eastern EWs of the city and a few wards in the north. People residing here have to travel long distances to access these facilities. The USG and FP surgery centres closely map the concentrated locations of private hospitals. The Integrated Child Development Service (ICDS) centres are located in the slums or close to them in the city.

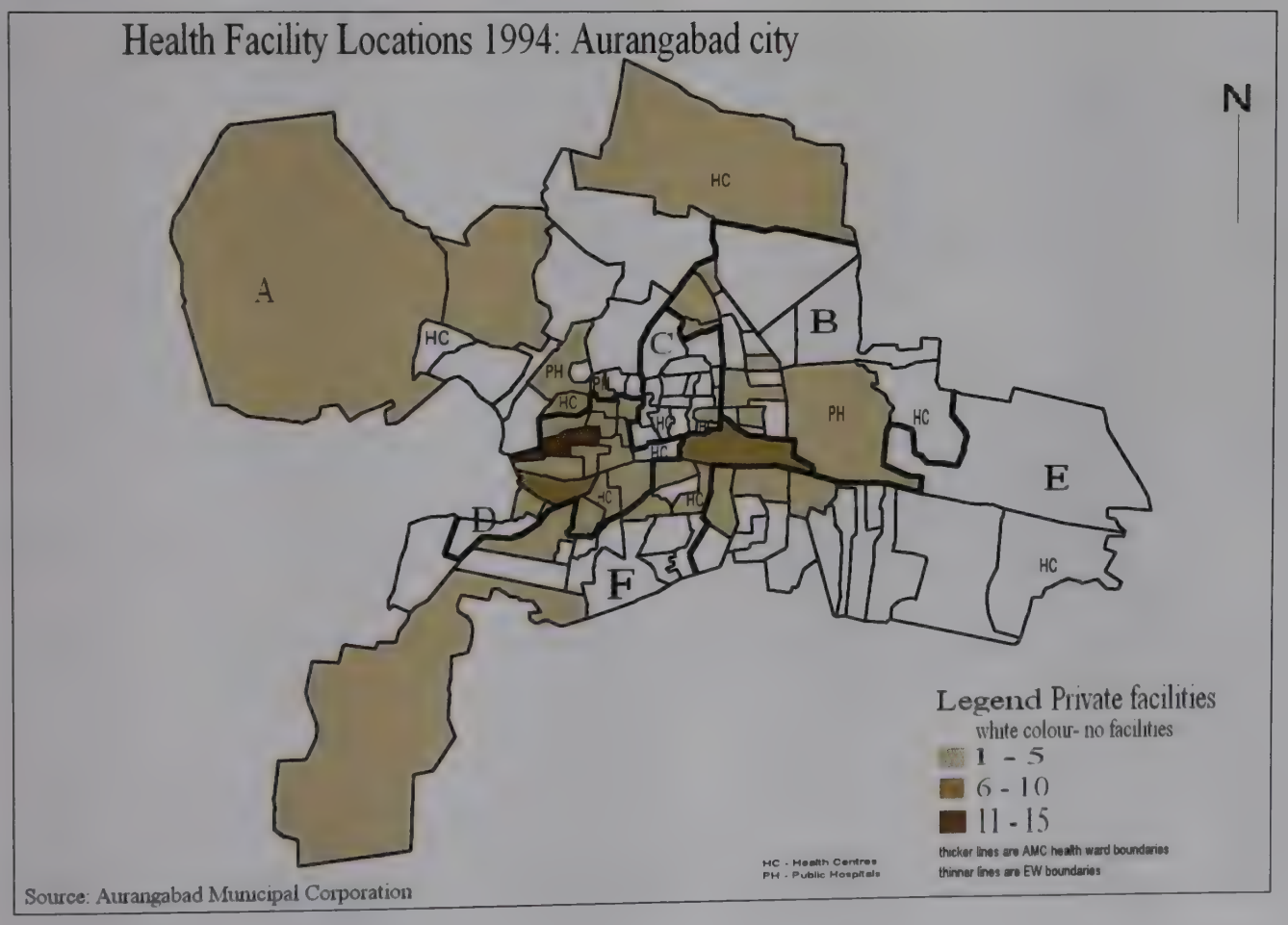
[8] Source: same as footnote 4

[9] Concentration here denotes the first 3-4 EWs that rank highest in the number of registered private facilities located in its precinct

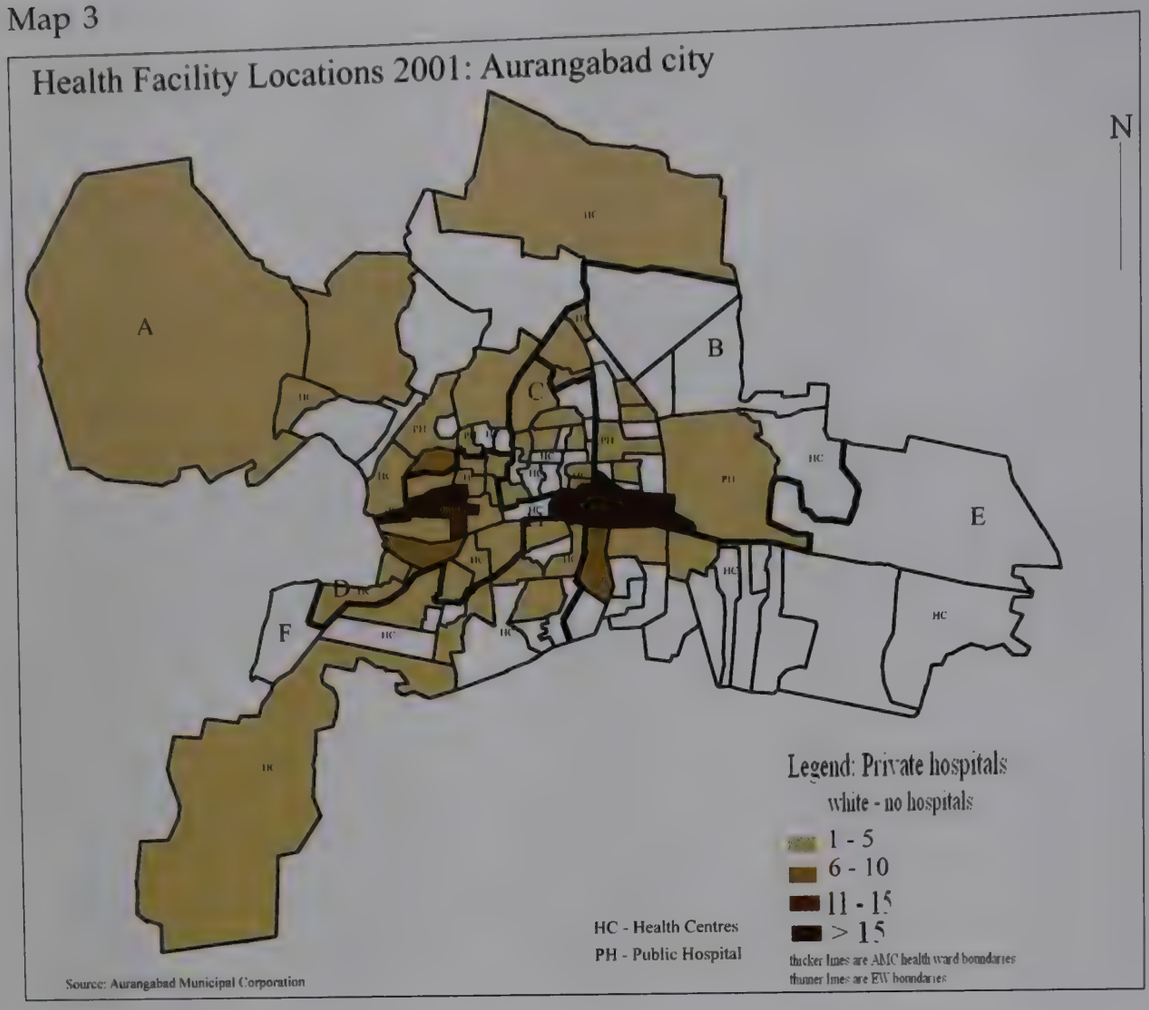
Map 1


Health Facility locations 1991: Aurangabad city
N
A
B
C
D
E
F
HC
PH
Legend
HC - Health Centre
PH - Public Hospital
thicker lines are AMC health ward boundaries
thinner lines are EW boundaries
Source: Aurangabad Municipal Corporation

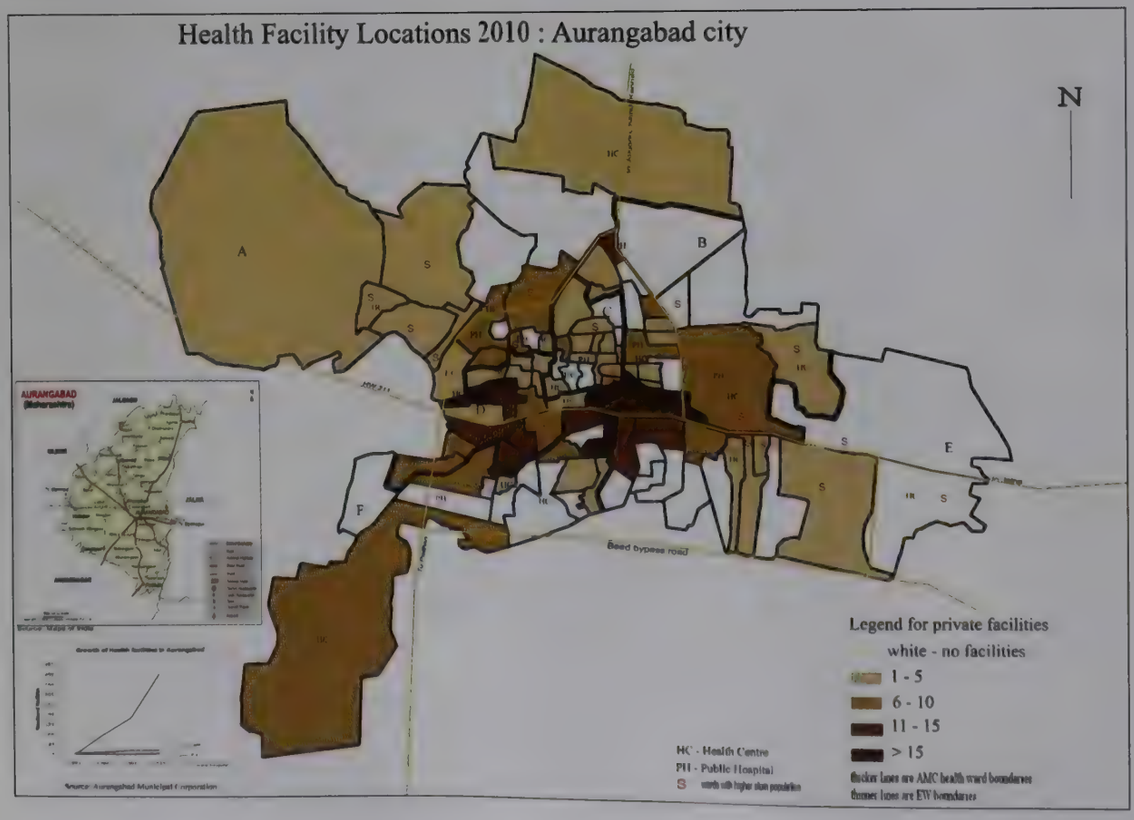
Map 2


Health Facility Locations 1994: Aurangabad city
N
A
B
C
D
E
F
HC
PH
Legend Private facilities
white colour- no facilities
1 - 5
6 - 10
11 - 15
thicker lines are AMC health ward boundaries
thinner lines are EW boundaries
HC - Health Centres
PH - Public Hospitals
Source: Aurangabad Municipal Corporation

Map 3


Health Facility Locations 2001: Aurangabad city
N
A
B
C
D
E
F
HC
PH
Legend: Private hospitals
white - no hospitals
1 - 5
6 - 10
11 - 15
> 15
HC - Health Centres
PH - Public Hospital
thicker lines are AMC health ward boundaries
thinner lines are EW boundaries
Source: Aurangabad Municipal Corporation

Map 4


Health Facility Locations 2010 : Aurangabad city
N
A
B
E
F
S
HC
PH
Legend for private facilities
white - no facilities
1 - 5
6 - 10
11 - 15
> 15
HC - Health Centre
PH - Public Hospital
S
thicker lines are AMC health ward boundaries
thinner lines are EW boundaries

Mapping has clearly revealed the changing accessibility and availability scenario in Aurangabad over the years. The location of slums, older health facilities, the major highways, nearby towns (part of Aurangabad's hinterland for health service needs) --all have contributed to the growth of health facilities in the city. The higher CBR may be partly attributed to the nearby Class III, IV and V towns, which have a good access to Aurangabad because of its good transportation and connectivity with the city. The maps clearly show areas in the city where accessibility can be increased by location of new facilities.

The study shows that the availability of UHP, PH and private hospitals have increased. Some parts of the city have better access to public facilities such as the south western and central parts of the city, since there is an increase of UHPs and PH here. Most of the public facilities have not been located in the slum areas but in a ward close by. The slum population has been growing in the north western part of the city, but very few UHPs or PHs have been located here. The location of private hospitals has been dictated by market considerations and are highly concentrated in upmarket areas in the western part of the city.

At present, the AMC is maternity and family planning focussed and it may be necessary to increase the number of beds in the general section. This may help the poor to access and utilize public facilities more and reduce their financial burden towards health expense. Such a measure will improve the health indicators for the city overall.

Nashik

Nashik, located on the banks of Godavari River, is the fourth largest city in the state. In 1991, the population of Nashik was 656925 and 1077236 in 2001 (Census of India 1991 and 2001). The population growth rate for the city during 1991-2001 was 63.98 percent (Tables 4-7). There were 108 electoral wards in 2005. Nashik has the second highest working population in the service sector (27%) after Aurangabad (31%).

Slums in Nashik are located along the Godavari River in Panchavati, Badrakali, Peth Road and Dindori Road (Map 7). There are a few slums along Trimbak Road and in clusters in Satpur area. Slums are also there in EW 108 near the hills. Near the city centre there are slums at Ganjamal area and at Kathda. Slums grew along the canal from Gangapur dam to Nashik Road and along the old railway lines. There are a few major slums in the city - Amrapalli slum, Jail Road (north of Nashik Road), Raju Nagar (near CIDCO[10]) and Peth Road (Vadarwadi, Phulenagar and Vajreshwar slum area).

Migration to MIDC area in Ambad (EW 108) occurred from Malegaon and from tribal areas from the west, while migration to CIDCO and Satpur areas is from the rural areas. The migrant populations settled here are from northern Maharashtra, Uttar Pradesh and Bihar. Migration is still taking place here. In the old Nashik (near the city centre, close to the Godavari River) people had migrated 20-30 years back. More cosmopolitan migrants are along Nashik Road mainly composed of non Maharashtrians in wards 38, 67, 73, 72 and 71[11].

Areas such as Mahatma Nagar, Canada Corner, Gangapur Road, Satpur Road have a rich population. CIDCO has middle class, mainly earlier factory workers. Nashik Road has a higher income population[12].

---

[10] City Industrial Development Corporation

[11] Source of Migration and Slum Data for Nashik city:
i) a public health specialist and doctor in the city for over 25 years
ii) a doctor and public health specialist from 1975 who has lived in Nashik from 1990
iii) a health official at Nashik Municipal Corporation (NMC) in the field for 26 years.

[12] Source: same as footnote 11

Health indicators for the city are shown in Table 10. CBR and CDR are slightly above the state level and the urban Maharashtra level. A slight increase can be noted during 2006-2008. This may/may not be due to an increase in slum growth rate post 2001 (Table 7). Birth rate is higher in the city owing to people using the facilities from outside the city. People from 2-3 talukas utilise the public hospitals, such as Bytco hospital. The periphery of the city has less number of hospitals as the adjoining rural area is not fully developed (source: footnote [11]).

Table 10: Health Indicators for Nashik City

Year	2005-06 India[1]	2006/07 Maha. State[2]	2006/07 Maha. Urban[2]	2006 Nashik City	2007 Nashik city	2008 Nashik City[3]
CBR	23.8	18.5/18.1	17.5/17.3	19.25	19.53	19.62
CDR	7.6	6.7/6.6	5.8/5.7	6.72	6.77	6.91

Source: basic data from Nashik Municipal Corporation of number of births and deaths for these years

[1] WHO report on basic health indicators
[2] Maharashtra rates from SRS Bulletin 2006 & 2007
[3] Calculated per 1000 for Aurangabad by the author

Public and Private Health Facilities

Public and private health facility ratios are shown in Table 11

Table 11: Ratios Public and Private Facilities[13] 1991-2010 for Nashik

Facilities	1991	1996*	2001	2009*
UHP/HC	1: 59720	1: 81431	1: 82864	1: 79541
Public Hospitals	1: 93846	1: 68903	1: 76945	1: 89484
Private Facilities	NA	1: 7109	1: 5855	1: 1937

**Using projected population (ratio: population/number of facilities)*

Public Health Facilities

In Nashik, the UHPs grew by 18 percent, while the population grew by 63.98 per cent (from 11 UHPs in 1991 to 13 in 2001). The ratios for UHPs have not shown any improvement with reference to the high population growth rate for the city during 1991-2001 and 2001-2009. What is interesting about Nashik UHP locations is that, out of the 18 UHPs, 12 of them are located in the same campus as NMC general and maternity hospitals, and one is in the civil hospital campus. Two of the NMC general hospitals have two UHPs each (JDC and Dr. Zakir Hussain hospital). Only five of them are at different locations. This locational pattern is likely to affect the slum population's accessibility to these centers. A more spatial spread of UHPs in reference to the slum population may have increased their accessibility. This pattern has been also noted by Medha (2009).

[13] See footnote 3

In 1991, five of the UHPs were located close to the old city centre, one at CIDCO, one at Gangapur area in the northwest, three north of Nashik Road and one at Satpur. Nashik Road and Satpur along with the CIDCO and Ambad area in the southwest were incorporated into the city limits much later, but before 1991 (Map 5).

Two new UHPs were added in 2001 at Kathda (EW 41) close to the city centre. This ward has a slum population. By 2009, five new UHPs were established in Ambedkar Nagar, close to the Amrapalli slum area just north of Nashik Road, in Ravivar Karanja (EW 28) and High School ward area (EW 44). Both these wards are close to the city centre and to the slum population near River Godavari. One UHP was established at Pimpalgaon (EW 82) at the city limits in the west. This also serves the rural population close by[14]. One UHP was established in Pelican Park at CIDCO (EW 102) on the Mumbai-Nashik highway.

Facilities are available in UHP, but staff behaviour holds people back from using these facilities (Source: NMC health official). The location of UHPs seem to be generally relevant in reference to the distribution of slum population in Nashik, but their accessibility can be increased by having a more spatially spread out locational pattern as some wards have two UHPs each. Also, it may be necessary to locate (or relocate) some UHPs along Peth and Dindori Roads, north of Godavari River, where there are more slums so as to increase their access to the slum population residing there (Map 7).

Public hospitals (NMC, state and central government) grew by 100 percent (from 7 in 1991 to 14 in 2001). The ratio has improved from 1991 to 2001, but became worse in 2009 (Table 11). Urban poor in Nashik are partly served by public health facilities. Municipal hospitals do not have a good reputation with the public. The quality of healthcare offered at public (NMC, civil) is not up to the mark in terms of facilities and manpower. NMC hospitals are usually used for delivery and immunization and ANC. Accident cases also use the public hospitals for sonography and blood test as the expenses are lower (source: same as footnote 11).

Private Health Facilities

The private facilities in Nashik show a marked improvement. In 1996, 126 facilities were registered under BNHRA with NMC. In 2001, this grew to 184. By 2009 there were 739 registered facilities[15] .

The intra-city analysis by electoral wards shows three major concentrations of private hospitals with two other pockets of concentration (Maps 8-10). The first area of concentration is at Tilakwadi (73 facilities) and Gole Colony (43 facilities). The High School ward also has a high number of facilities. Ravivar Karanja has 21 facilities. Tupsakhare Lawn and Panchashil Nagar also have a high number of private facilities. These are on the western side of the Mumbai-Nashik highway. On the eastern side of the highway, the concentration extends to Vaidya Nagar and Bhaba Nagar. The second area of concentration is at CIDCO. These are mainly at Trimurti Chowk and wards 78 and 79. Almost all the wards of CIDCO along the Mumbai-Nashik highway show a high concentration of facilities.

The third area of facility concentration is in the Panchavati area (area north of the Godavari River). The highest concentration is at Sardar Chowk and Indra Kund areas. All the EWs in the Panchavati area has a facility. Most of the facilities are in the wards close to the river, across the first area of concentration. Satpur and Nashik Road have a low number of facilities. Only eight EWs in Nashik do not have any registered private facility. The facilities are more evenly distributed in the city. Most of the USG and FP surgery centres are also found in areas of higher facility concentration.

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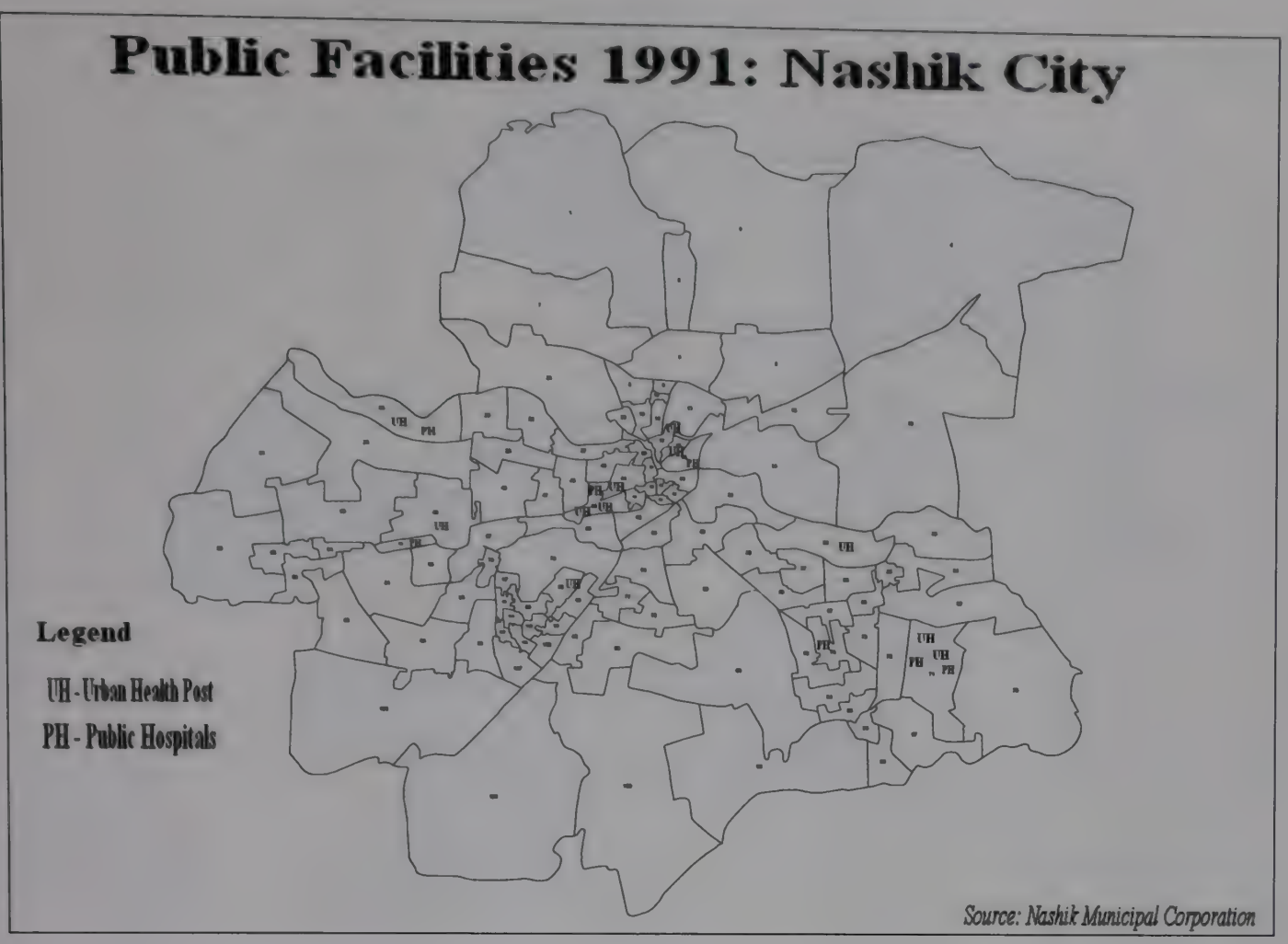
[14] NMC health official

[15] In the analysis only those facilities registered till 2009/2010 in the NMC list was used so as to avoid duplication as the NMC data was not updated.

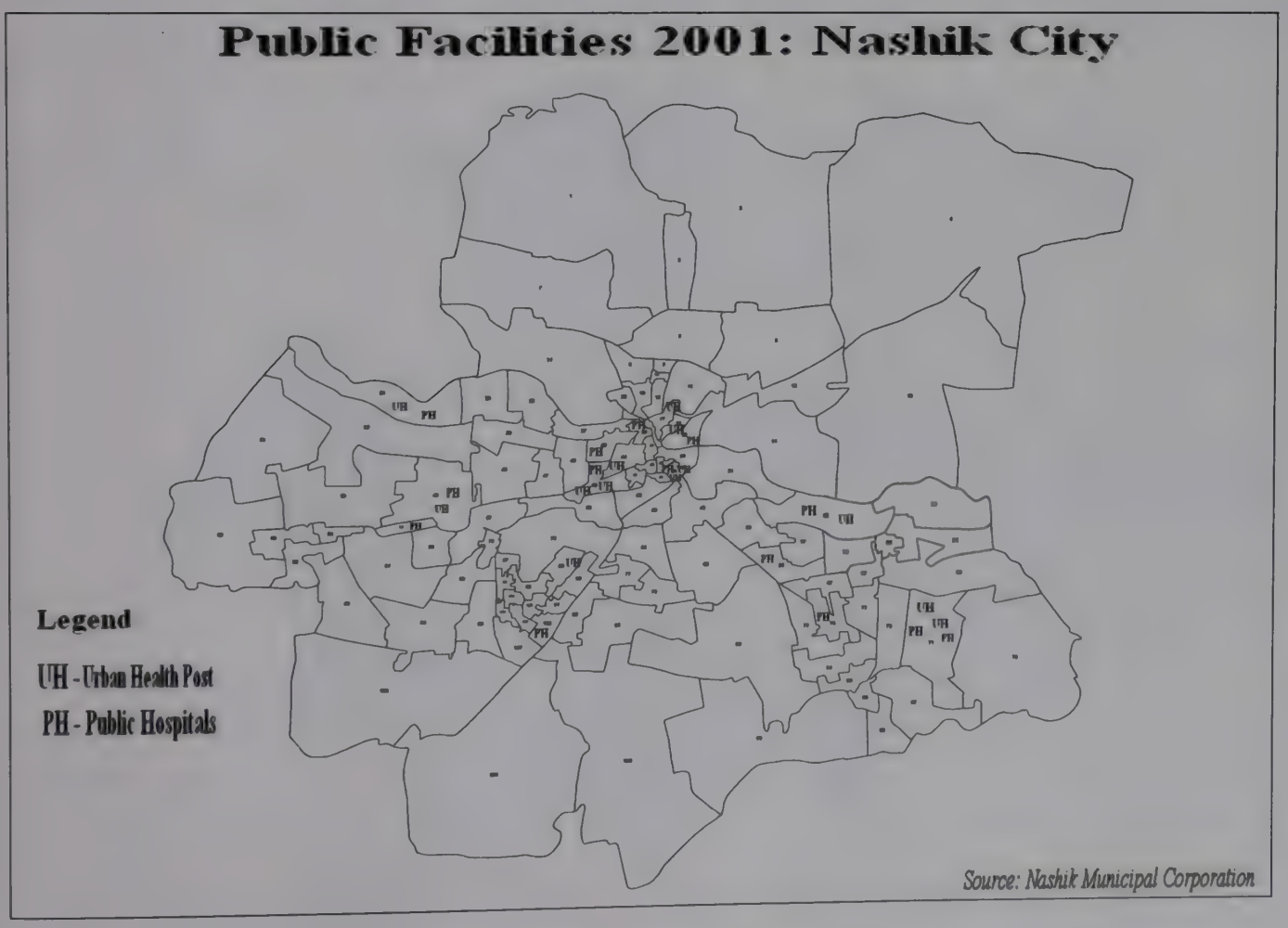
The facilities in the city are accessed within a range of 30 kilometres by the surrounding population. Malegaon, Dhule, Nifad, Dindori, Vani, Pimpalgaon, Sinnar and other towns do not have specialized facilities, these people come to Nashik city for their specialized health needs (see footnote 10)

The older parts of the city on both sides of the river have a heavy density of population and built up area. This area had private facilities, but as the doctors could not locate or expand facilities here, the expansion took place south of Godavari where vacant land was available, away from the already densely populated areas. The three wards with the highest concentration reflect this trend. Besides, the higher income residences were located close by in the Gangapur area in the west. The new area was easily accessible to the city population and the surrounding rural population as the bus hubs were located nearby. The development of private facilities at CIDCO served the new development and migration that continue to take place here (source: see footnote 11).

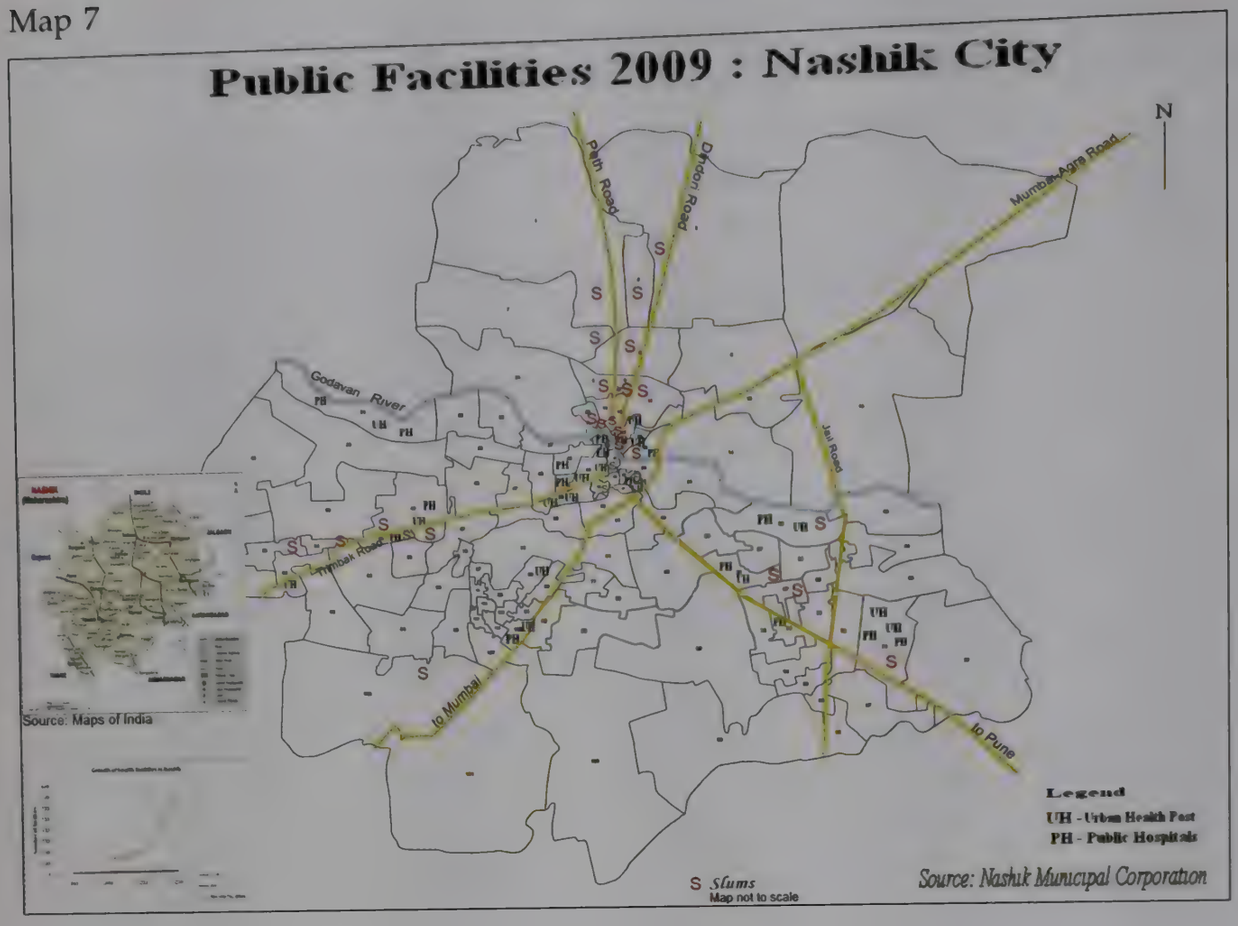
Map 5


Public Facilities 1991: Nashik City
Legend
UH - Urban Health Post
PH - Public Hospitals
Source: Nashik Municipal Corporation

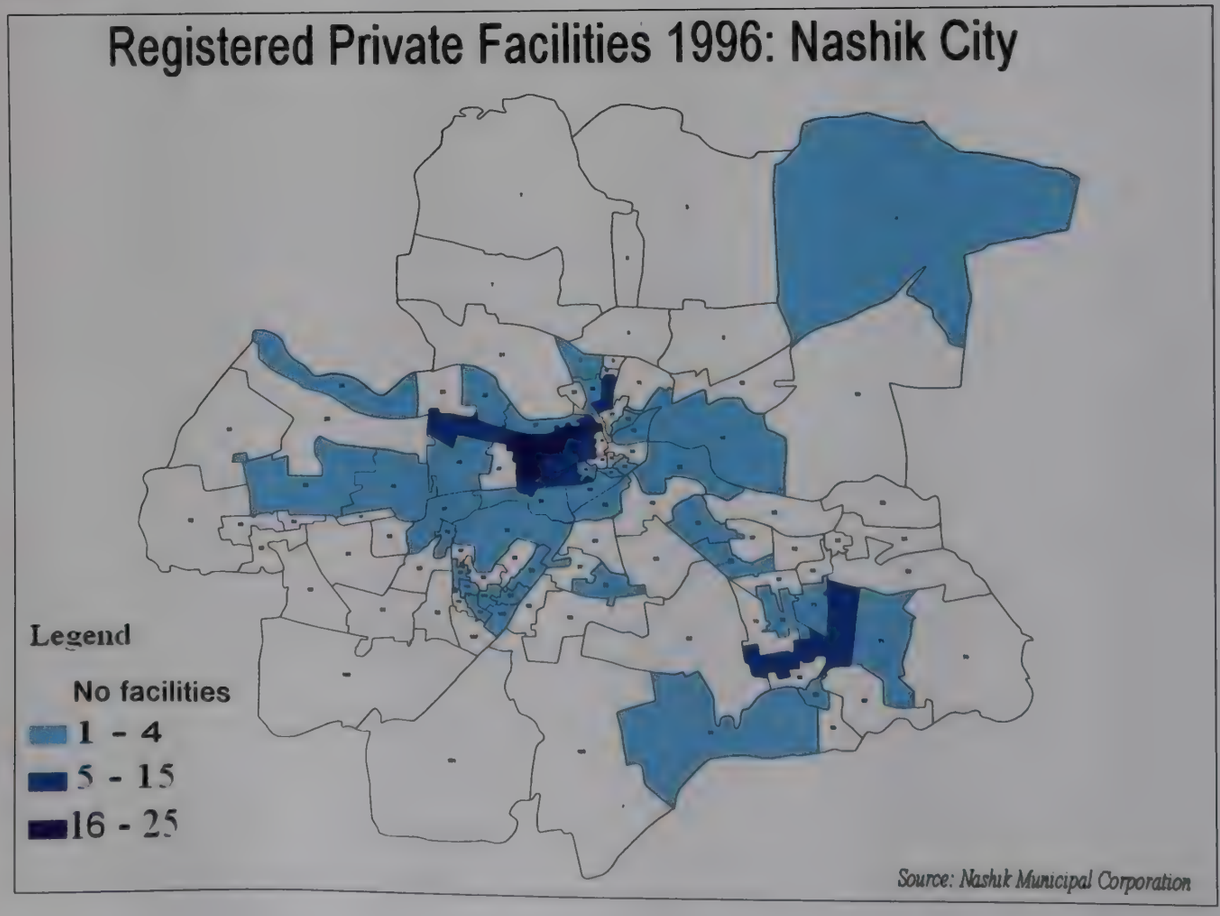
Map 6


Public Facilities 2001: Nashik City
Legend
UH - Urban Health Post
PH - Public Hospitals
Source: Nashik Municipal Corporation

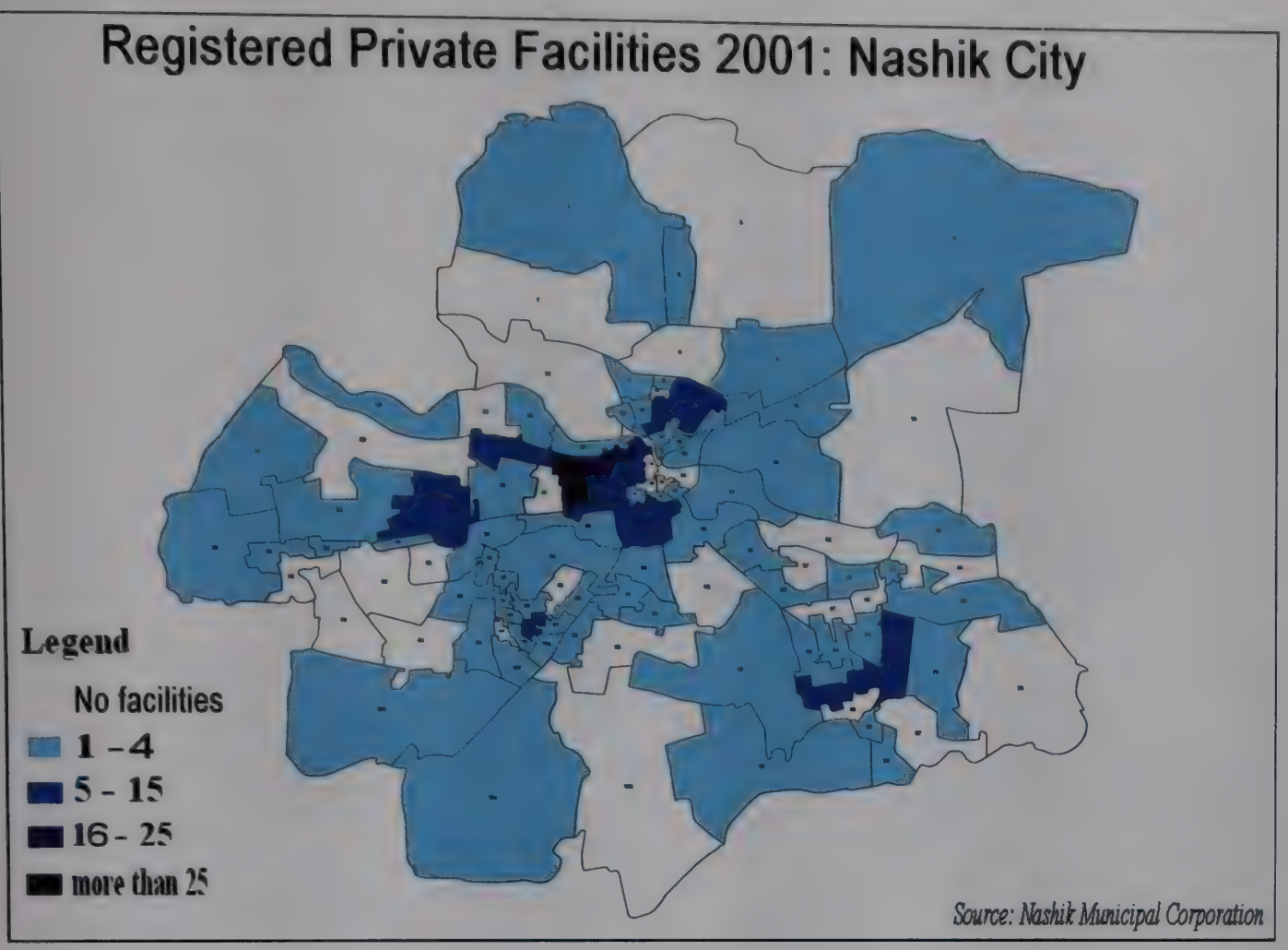
Map 7


Public Facilities 2009 : Nashik City
N
Pathi Road
Dindori Road
Mumbai-Agra Road
Godavari River
Jail Road
Trimbak Road
to Mumbai
to Pune
Source: Maps of India
Legend
UH - Urban Health Post
PH - Public Hospitals
S Slums
Map not to scale
Source: Nashik Municipal Corporation

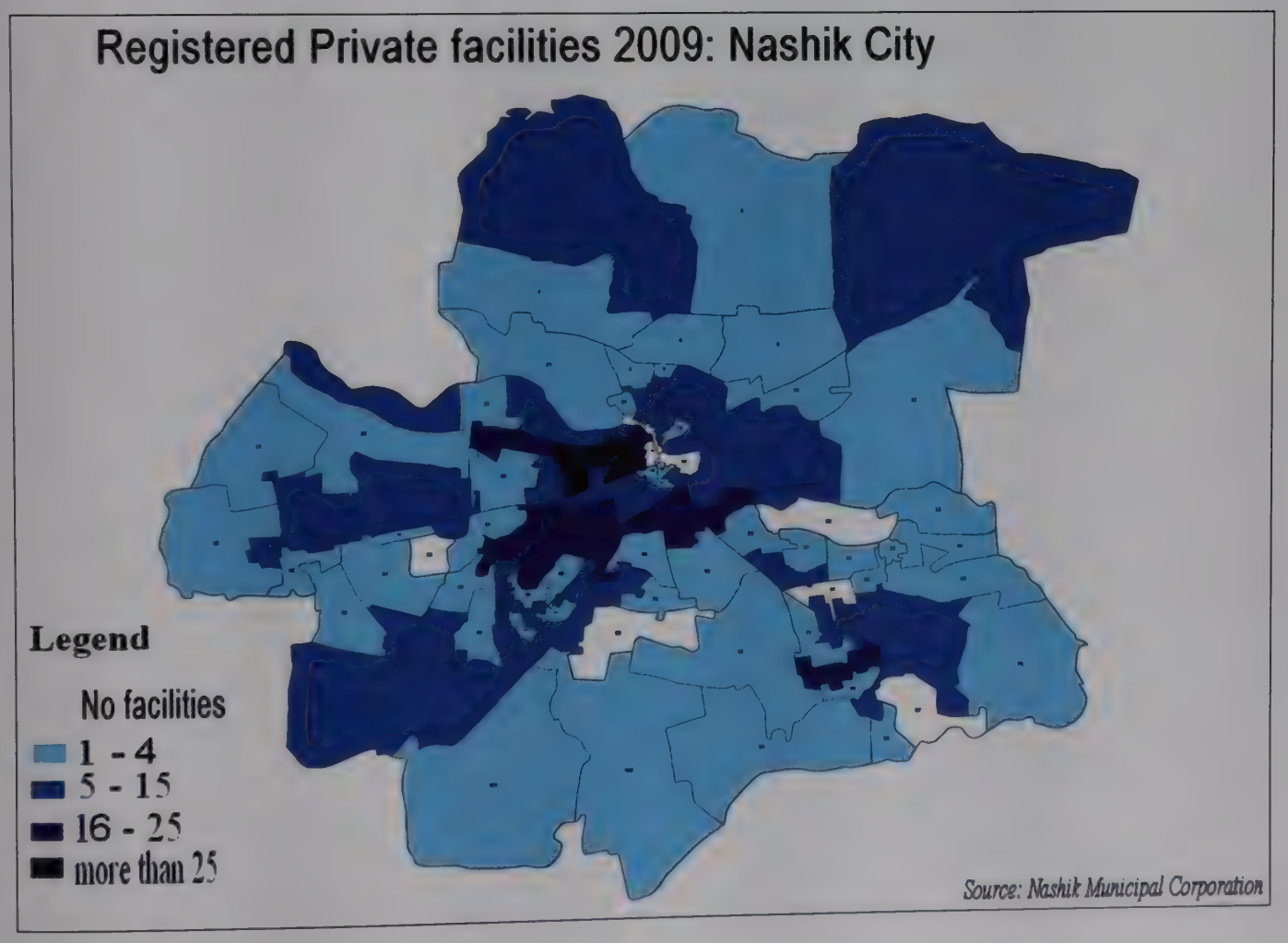
Map 8


Registered Private Facilities 1996: Nashik City
Legend
No facilities
1 - 4
5 - 15
16 - 25
Source: Nashik Municipal Corporation

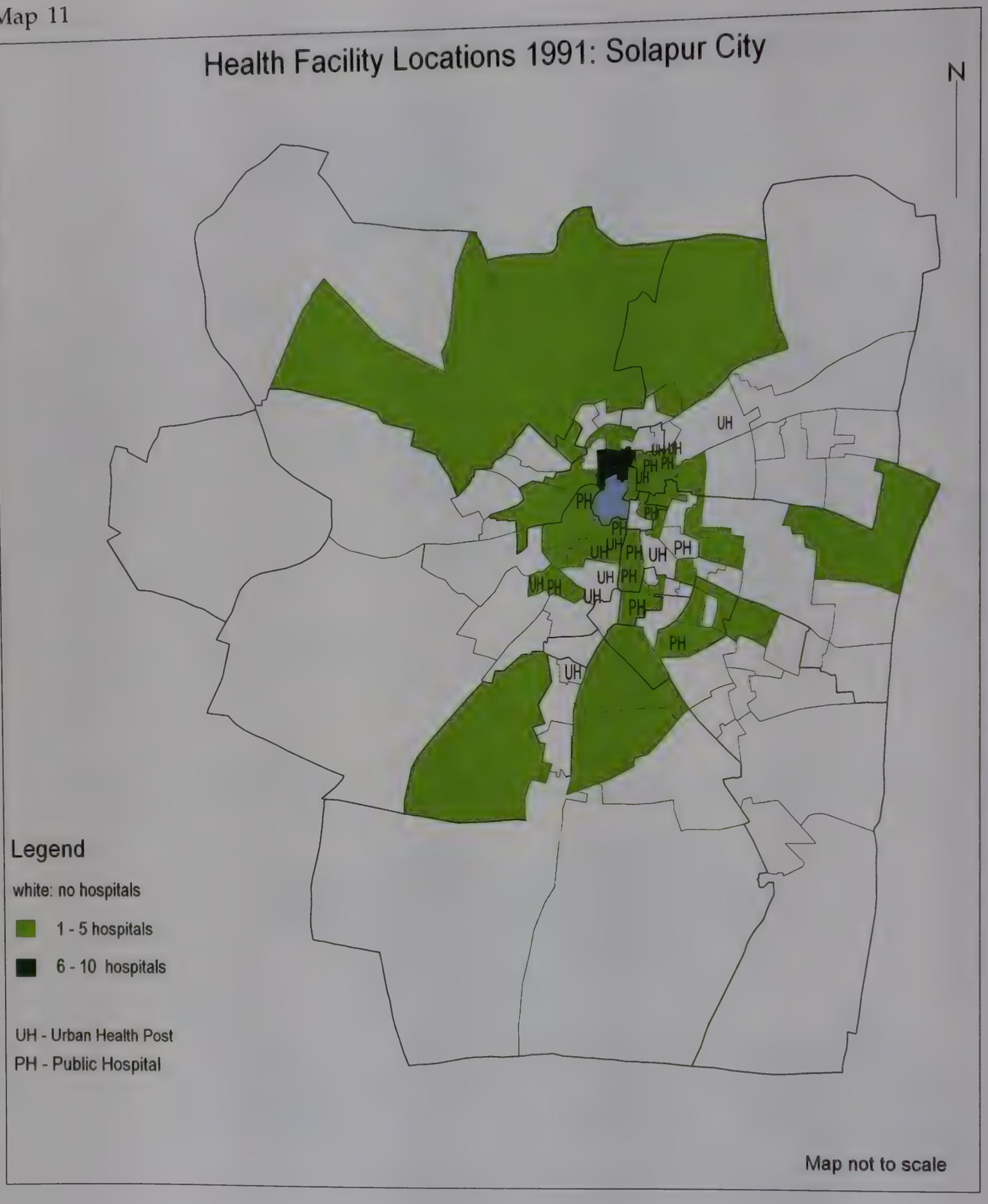
Map 9


Registered Private Facilities 2001: Nashik City
Legend
No facilities
1 - 4
5 - 15
16 - 25
more than 25
Source: Nashik Municipal Corporation

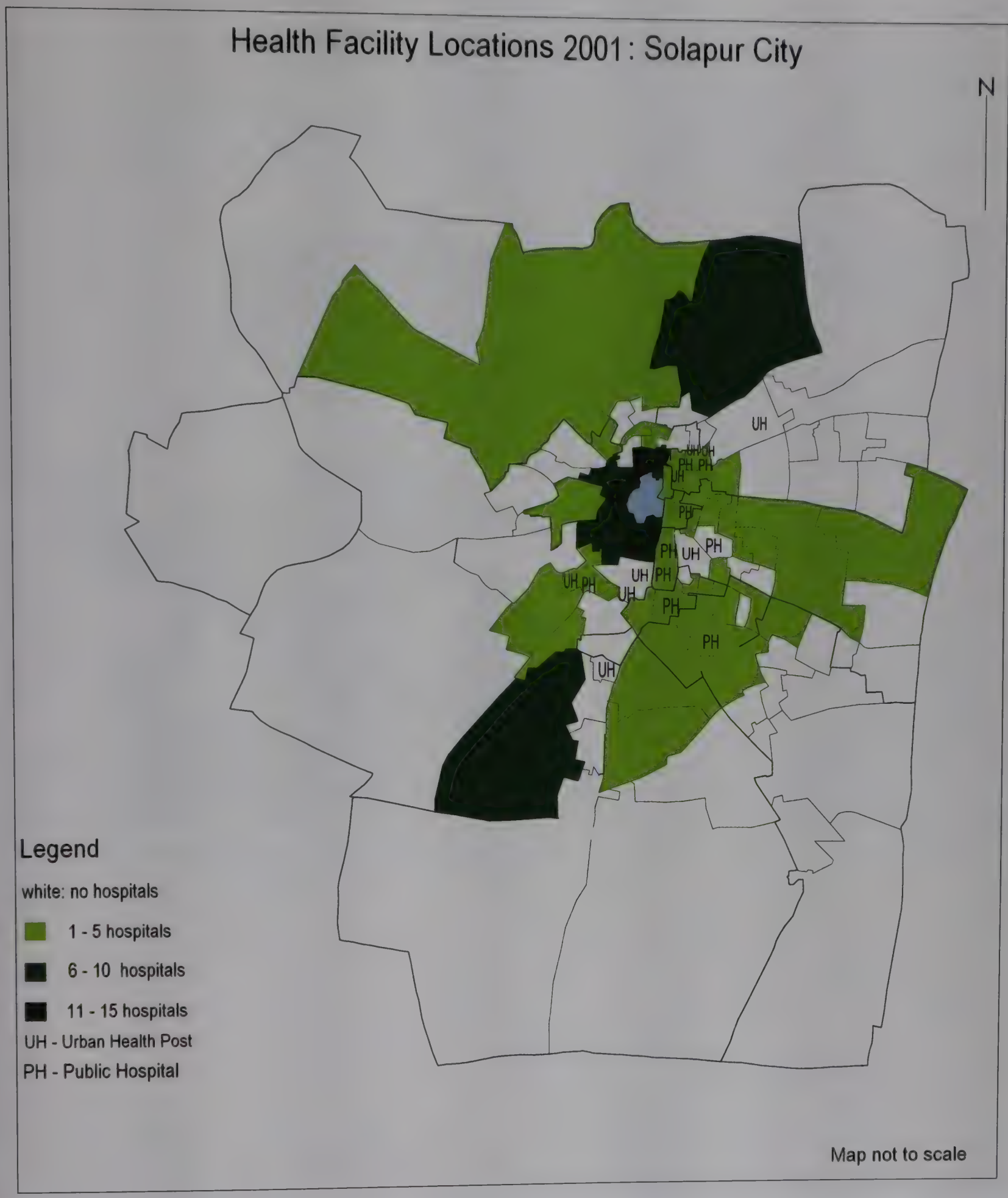
Map 10


Registered Private facilities 2009: Nashik City
Legend
No facilities
1 - 4
5 - 15
16 - 25
more than 25
Source: Nashik Municipal Corporation

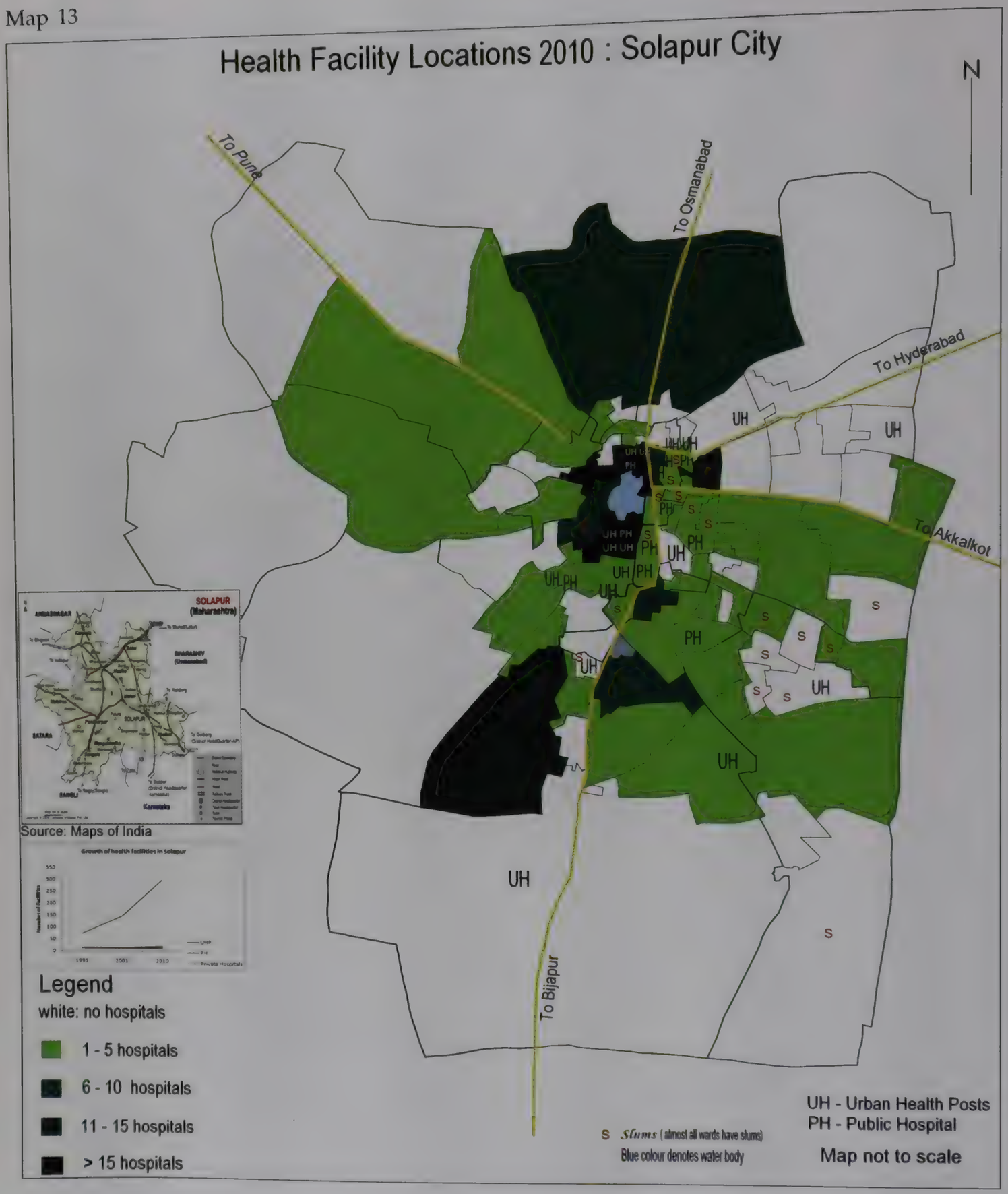
Map 11


Health Facility Locations 1991: Solapur City
N
Legend
white: no hospitals
1 - 5 hospitals
6 - 10 hospitals
UH - Urban Health Post
PH - Public Hospital
Map not to scale

Map 12


Health Facility Locations 2001 : Solapur City
N
UH
PH
UH
PH
UH
PH
UH
PH
UH
PH
UH
PH
PH
UH
Legend
white: no hospitals
1 - 5 hospitals
6 - 10 hospitals
11 - 15 hospitals
UH - Urban Health Post
PH - Public Hospital
Map not to scale

Map 13


Health Facility Locations 2010 : Solapur City
N
To Pune
To Osmanabad
To Hyderabad
To Akkalkot
To Bijapur
UH
PH
S
SOLAPUR
(Maharashtra)
Source: Maps of India
Growth of health facilities in Solapur
Legend
white: no hospitals
1 - 5 hospitals
6 - 10 hospitals
11 - 15 hospitals
> 15 hospitals
S Slums (almost all wards have slums)
Blue colour denotes water body
UH - Urban Health Posts
PH - Public Hospital
Map not to scale

Solapur

Solapur city is located in the south-east corner of the state, close to the borders of Andhra Pradesh and Karnataka. It is a major transport hub for national railways and roadways. There were 98 electoral wards in 2005. The population of Solapur city was 604215 in 1991 and 872478 in 2001 (Census of India 1991 and 2001), the population growth rate being 44.40 percent 1991-2001 (Table 4). The population density within the city varies from 1618 per square km to 23,622 per square km. (Solapur RCH report 2003).

The slum population of Solapur was 180882 in 2001, that is, 20.7 percent of the city's population (Slum Population, Census of India 2001: 216). In 2008 there were 360000 people residing in slums (Tables 5-7), comprising 36.62 percent of the city's population and with a growth rate of 99.02 percent in 2001-2008. The expected growth rate 2001-2011 is 131.92 percent.

The slums are distributed throughout the city, concentrated more in the eastern part of the city (Map 13). The main EW with slums are Kanna Chowk (wards 27, 37), wards 53, 38, 39, 40, 85, 35, 61, 66, 26 and also at Majrewadi wards. Garibi Hatao slum area has over 50,000 population and covers three EWs. These areas are occupied by the weaver community from Andhra Pradesh. Their housing is mostly thatched. Though the textile mills in the city closed between 1995 and 1997, it has not affected the population growth here. Skilled labourers are still here but do not have jobs. Women work in laundry, bidi rolling and making incense sticks. Women contribute more to the economy among the lower class people. The concentration of the main workers is in Jilla Parishad, Solapur Corporation and MIDC areas, along Akalkot Road. There are workers in construction industry at the city centre and nearby areas. These workers are mainly from Karnataka and Andhra Pradesh, who reside in slums. The middle class reside mainly along Bijapur Road, Railway Lines ward, Hotgi Road, Lashkar (near Sath Rastha), Kasbe and other areas[16]. There is out migration from the city of the younger middle class to Pune, Mumbai and Hyderabad. There is a growing proportion of older population in the city.

Health indicators for the city are shown in Table 12. Birth rate and SBR have been increasing steadily. CBR has increased as people from rural areas come here for registration and delivery. There is a slight decrease in CDR in 2009. There is a jump in IMR rates for the city in 2009. This may indicate increasing urban poor in the city and also an increase in the proportion of those who have home delivery. There is a higher IMR and MMR in the city. This may be due to a lack of toilet hygiene and lack of basic civic facilities in the slums[17].

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[16] This information has been compiled from three key informant interviews from Solapur:
i) A former teacher in community medicine for 35 years at a medical college and a resident of Solapur for last 20 years. ii) A health official at Solapur Municipal Corporation (SMC) for 12 years and living in Solapur for the past 18 years iii) Director of an NGO with experience in the field from 1993, but who has lived in Solapur all his life.

[17] The high IMR and MMR rates are suppressed by the civic authorities according to source (iii) above quoted in footnote 16. The peripheral areas are still a village. There are drainage and water problems and a lack of facilities in this area according to the SMC health official. This may have increased the IMR rates for the city.

Table 12: Health Indicators for Solapur City

Year	2006	2007	2008	2009
CBR	22.39	23.30	23.51	24.49
CDR	8.35	8.26	8.65	8.53
IMR	26.91	25.24	25.85	32.61
SBR	18.40	14.71	15.32	16.89
Mid year population	960708	977162	993615	1010063

Source: Solapur Municipal Corporation

Public and Private Health Facilities

The availability of public and private health facilities in Solapur are shown in Table 13.

Table 13: Ratios of Public and Private Facilities 1991-2010 for Solapur

Facilities	1991	2001	2010*
UHP/HC	1: 46478	1: 67114	1: 54391
Public Hospitals	1: 50351	1: 72707	1: 86119
Beds	NA	NA	1: 814
Private Hospitals	1: 8277	1: 6017	1: 3503
Beds (Private)	NA	NA	1: 244

**Using projected population (ratio: population/number of facilities)*

Public Health Facilities

There were 13 UHPs established 1985-1991 in the city. The ratios of UHPs to the population in 2001 present a dismal picture - the number of UHPs has not increased, but the population has. There is a cluster of UHPs close to the city centre and this cluster has not changed in 2001 though the city limits have been extended. The ratio of UHP to total population has improved in 2010 as six new RCH-UHPs centres were added in 2004 in the peripheral areas of the city. These were established in the villages that were incorporated into the city in 1992. As the city's slum population has increased manifold (population growth rate is about 21%, slum growth rate almost 132% 2001-2011, Table 7), the same expansion is not been seen in the growth of UHPs, this in turn will affect the availability and reduce its average accessibility to the urban poor within the city. As the proportion of slum population is increasing many times faster than the city's population growth, there is need to increase the number of UHPs and its spatial spread so as to meet the needs of the population that require its services. The slum population in Solapur is distributed throughout the city with a higher proportion in some EWs (Map 13).

The number of municipal and government hospitals also remained static during 1991-2010 (8 Maternity Hospitals, 4 PH), though the city population growth rate during this period was 44.40 percent. As a result, public hospitals, including municipal hospital ratios have worsened.) As no reservations were made, no new facilities were established. This was ascribed to the lack of political will power at the city level. Owing to this, no new development has taken place and no new staff recruited by the government and the SMC. Basic health services are available in the public facilities, but no specialized services are available at government hospitals at Solapur. People generally go to Pune or Hyderabad for these. Poor people in the city cannot afford to go to another city hospital. Therefore they go to private hospitals or

unqualified medical practitioners or simply neglect their health. Many of the government staff have retired and the new staff hiring policy of SMC, which has filled only 35 percent of the vacancies, has worsened the situation. Industrial decline has affected the city health facility and its socio-economic growth[18].

Private Health Facilities

Registered private facilities grew by 98 per cent during this same period (73 in 1991, 145 in 2001). The number increased to 295 by 2010. From 1991 to 2010, the growth rate was over three times. Though there is growth in the number of private hospitals, its spatial spread has been constrained. Most of the growth has taken place close to the city centre. Over 37 percent of EWs do not have any registered private facility. Growth has taken place close to the Bijapur and Pune highways. The only concentration is near the city centre in the Railway Lines area, close to the State Transport Corporation bus stand and in Navipeth market area.

There is no heavy concentration of hospitals as in Aurangabad and Nashik cities. There is a paucity of facilities in the south, west and northeastern wards. People residing in these areas have less access distance wise and have to travel towards the city centre where there is a concentration of hospitals (Maps 11-13). People have moved outwards, but facilities have not moved outwards. People have to come to the city centre for all facilities and to use the health facilities because they are located there.

[18] Source: see footnote 16

PH-120
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Nagpur

Nagpur city is practically at the geographical center of India. All major highways NH-7 (Varanasi - Kanyakumari) and NH-6 (Mumbai - Sambalpur - Calcutta) intersect the city. The major railways trunk route (Mumbai, Chennai, Howrah, Delhi) pass through the city.

Nagpur had 136 EWs in 2005. Population of Nagpur was 1,624,752 in 1991 and 2,052,066 in 2001 (Census of India 1991 and 2001). Nagpur's population growth of 26 percent during 1991-2001 is lower than the national urban population growth rate of 31.16 percent and the state's urban population growth rate of 34.31 percent during the same period (www.censusindia.gov.in).

The slum population of the city in 1991 was 472865, that is, 29.10 percent of the city's population (Census of India 1991 series 14). By 2001 it was 737219, 35.93 percent of the city's population. The slum population growth rate in 2001-2011 was estimated at 35.62 percent (Tables 5-7). There is a higher proportion of slum population in the areas of Satranjipura, Aashi Nagar, Bhandewadi, Gittikhandan, Tajbagh, Indora and Kalamana Market. Dipty Signal area also has a major slum, besides Hazari Pahad area. Slums are also located at Vinoabhave Nagar, Chandramani and Surendragad and they are spread all over the city (Map 16). There is increasing migration from Andhra Pradesh, Madhya Pradesh and Chattisgarh and most of these new migrants settle in the slums. Most migrants are from Chattisgarh area and they reside in north Nagpur. In the last ten years, the Nagpur slum population increased around outer ring road of Nagpur on the eastern and northern sides. Kalamana area in the north has a wholesale vegetable and grain market. Most of the labourers working here are from Chattisgarh. They reside mainly at Rajiv Gandhi Nagar, Laxmi Nagar and Chikhali. Many of the migrants come as labourers for construction work, industries and as street vendors[19].

The higher income population areas are Dharampeth, Ramdaspeth, Gokulpeth, Ramnagar, Shivaji Nagar, Gandhi Nagar, Ravi Nagar, Civil Lines, Shankarnagar, Bajajnagar, Mahal, Itwari, Gandhibag and Byramji Town. All these areas, except the last, lie in the western part of the city close to the Ambazari Lake. The main commercial areas of the city are mainly in Sitabuldi, Sadar, Civil Lines, Gokulpeth, CA Road and Mahal (rediff.com/money/2007/.../17nagpur.htm).

Health indicators for the city are shown in Table 14. An increase in CBR and CDR can be noted from the table. This may due to an appreciable increase in the slum population of the city. Increasing CDR has been also attributed to a low ANC (Anti Natal Clinic) registration and also due to people who come here from rural areas for treatment and some of them die while under going treatment[20]. There is appreciable decrease in IMR and SBR from 2006-2009.

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[19] Information from
i) Founder trustee and urban health coordinator in Nagpur for over 25 years
ii) Director of a trust hospital and involved in community development for the last 20 years
iii) Health official from the Nagpur Municipal Corporation (NMC) involved in the field from 1986, and at NMC for the past one year.

[20] Source: footnote 19

Table 14: Health Indicators for Nagpur City

Year	2005-06 India[1]	2006/07 Maha. State[2]	2006/07 Maha. Urban[2]	2006 Nagpur City[3]	2007 Nagpur City[3]	2008 Nagpur City[3]	2009 Nagpur City[3]
CBR	23.8	18.5/18.1	17.5/17.3	21.79	21.1	21.79	22.11
CDR	7.6	6.7/6.6	5.8/5.7	8.04	9.45	8.81	9.53
IMR	57	35/24	26/24	19.43	NA	17.55	17.49
SBR	9	12/12	11/11	5.59	NA	7.36	4.19

Source: basic data from Nagpur Municipal Corporation on number of births, deaths, deaths below one year and still births for 2006-2009

1 WHO report on basic health indicators
2 Maharashtra rates and SBR from SRS Bulletin 2006, 2007& 2008
3 Calculated per 1000 for Nagpur city by the author

A comparison of a few health indicators by slum/non slum population of 2005-06 is revealing. The NFHS-3 (Ministry of Health and Family Welfare 2009) survey was a sample survey of households in slum, non slum and the poor of eight Indian cities. The report mentioned that not all the slum population is poor.

Infant mortality for Nagpur at the city level for 2005-06 was 43/1000 and under five mortality was 50/1000 as reported by NFHS-3. Other indicators are shown in Table 15.

Table 15: Health Indicators for Nagpur 2005-06

	Slum	Non Slum	Poor
IMR	48.4	39.2	64.3
Under 5 mortality rate	59.5	43.6	71.4
Percentage of children under weight	42	28	45
Percentage of children 12-23 months who received basic vaccination anytime before the survey	57	76	NA
Percentage of women who received 3 or more ANC visits	81	94	73
Percentage of assisted live births by health personnel	81	87	63
Percentage of children 6-59 months with anaemia	71	58	78
Percentage of women 15-49 years with anaemia	49	52	56
Percentage of people using public health facilities	22	18	24
Percentage of people using NGO/Trust hospitals/clinics	0.1	0.3	0.3
Percentage of people using private medical sector	77.5	81.5	75.6

Source: NFHS-3 2005-06

The NFHS-3 report on household survey on why people do not use government facilities showed that there were three major reasons: the poor quality of care, the lack of a nearby facility, and excessive

waiting. For Nagpur, the lack of a nearby facility was the most common reason cited. Besides these three reasons, the timing of the facility was found inconvenient. In general, the reasons stated by non-slum dwellers, slum dwellers and the poor were similar. People who are poor generally show less concern about the long waiting time, but they are more likely to complain about the lack of a nearby facility.

The health indicators in Table 15 make it clear that the health of slum and poor population in Nagpur needs to be improved. This could be carried out by locating more facilities that are more accessible and this will invariably improve the city's health indicators.

Public and Private Health Facilities

The availability of public and private health facilities in Nagpur are shown in Table 16.

Table 16: Ratios of Public and Private Facilities 1991-2010 for Nagpur

Facilities	1991	2001	2010*
UHP/HC	1: 147705	1: 186551	1: 117523
Public Hospitals	1: 203094	1: 228007	1: 274220
Beds	NA	NA	1: 883
Private Hospitals	1: 13209	1: 5289	1: 8366
Beds	NA	NA	1: 344

**Using projected population (ratio: population/number of facilities)*

Public Health Facilities

UHP ratios show a worsening scenario as the population increased from 1991 to 2001. There were 11 UHPs during this period (growth rate of 0%). The ratios have improved 2001-2010 as ten new UHPs were added. In 1991, six of the UHPs were close to the city centre and four were close to the Ring Road that encircles the city; and one in the extreme western ward (EW 46). The spatial distribution is more spread out by 2010 as 10 new UHPs were added in 2008 in the peripheral areas of the city (Maps 14-16). The slum population has increased around the Ring Road especially in the east. Four UHPs were added in these areas. The other three UHPs were located close to the Ring Road in the north western part of the city, all in wards of growing slum population. Three more were added closer to the city centre as slums have grown there due to in-migration. This means that there is an increase in the availability and accessibility to UHPs for the slum population in this area, as the number and the spatial distribution of UHPs have increased. Yet, the number of UHPs is less compared to the population and the slum population for the city as a whole. Access decreases in the rainy season as the slum areas are not walkable[21].

The ratio of population to public hospitals also deteriorated between 1991 and 2001 and worsened from 2001-2010, as only one new public hospital was established (from 8 public hospitals to 9 public hospitals), a growth rate of 12.5%) at Thandapeth, located close to the city centre. This ward also has a slum population. No new hospitals were added for a whole decade between 2001 and 2010. All the hospitals are in the eastern part of the city, five of them being closer to the city centre. Four are located in the central south eastern part of the city, close to the medical college and hospital near Sakkardara. The public hospitals are within easy access to the slum population in the city.

[21] Source: footnote 19

The government hospitals in Nagpur are overburdened with patients. They are neither well equipped no do they offer qualitative service. There is a lack of doctors too. The Government Medical College at Nagpur was set up in 1956 with 500 beds. In 2010 it needs to have 2000 beds, but there has been no increase in the number of beds to match the growing need[22].

Private Health Facilities

The ratios of registered private hospitals show a tremendous improvement as the number of hospitals has increased drastically. Private facilities grew faster than the population. Registered private hospitals were 123 by 1991, grew to 388 by 2001 and to 641 in 2010. The growth rate between 1991 and 2001 was 215 percent and from 2001 to 2010 was 65 percent. The disparity in the availability of public and private health facilities becomes obvious when we look at the population bed ratios. The public facility bed ratio is 1: 883, while the private facilities have a ratio of 1: 344 (Table 16).

In 2010, there were four major areas of registered private hospital concentration in the city (Maps 14-16). Of these, Lendra Park-Ramdaspeth has a very dense concentration of hospitals (106). Adjacent to this is Sitabuldi (29 hospitals) and Dharampeth with a greater concentration of hospitals. These wards are close to NH 6. Initial and later locations of private health facilities in the city have followed the residential locations of middle and the upper middle class. The initial locations of private facilities were central because the higher income residences were centrally located. The higher income residence also included areas of Dhantoli and Civil Lines. The area first developed as the city centre and is close to the market. Sitabuldi is the major market area in the city and is centrally placed.

The second major area of private hospital concentration is the NEERI area in the south western part of the city and away from the city centre (39 hospitals). It is adjacent to the Ring Road and along the NH 7. The area has a higher income area population. Areas like NEERI and the adjacent Narender Nagar, Rana Pratap Nagar have a dense concentration of private hospitals, so new locations in the vicinity has developed in Gittikhandan, Bhandara Road, Manish Nagar, Hingna (MIDC area), Katol Road, Kampthi Road and others. The third area of hospital concentration is at Sakkardara in the south east, close to the major State Highway 9. Sakkardara area is close to the Government Medical College and Hospital. This is also a newly developed residential and market area and there is a growing concentration of private hospitals recently.

The fourth area is Indora (23 hospitals) in the northern part of the city, between NH 69 and NH 7 and adjacent to Byramji Town, a high income area and a newly developed residential and market area.

The peripheral wards in the north-east and south-west do not record any registered private hospitals. Over 30 percent of the wards do not have any private facilities. Also, a few wards close to the city centre do not have any private hospitals. This was due to the fact that the spatial spread, based on economic criteria, was in Ramdaspeth area. Areas in the northern electoral wards NARI, NARA, Kalamana Road, Bella-Besa and others (wards 4, 2, 1) are new developing areas, so there is a lack of hospitals here. The western EW comprise of areas such as Seminary Hill which is a hilly and forested terrain. It has the Air Force Colony and Ambazari Lake, and has no hospitals. Ayodhya Nagar, Mayawada, New Subhedar Layout, Rameshwari, Ramnamarathi, Navapura, Pardi, Vardhaman Nagar on the urban fringe is a newly developing area. There are very few hospitals registered in these areas.

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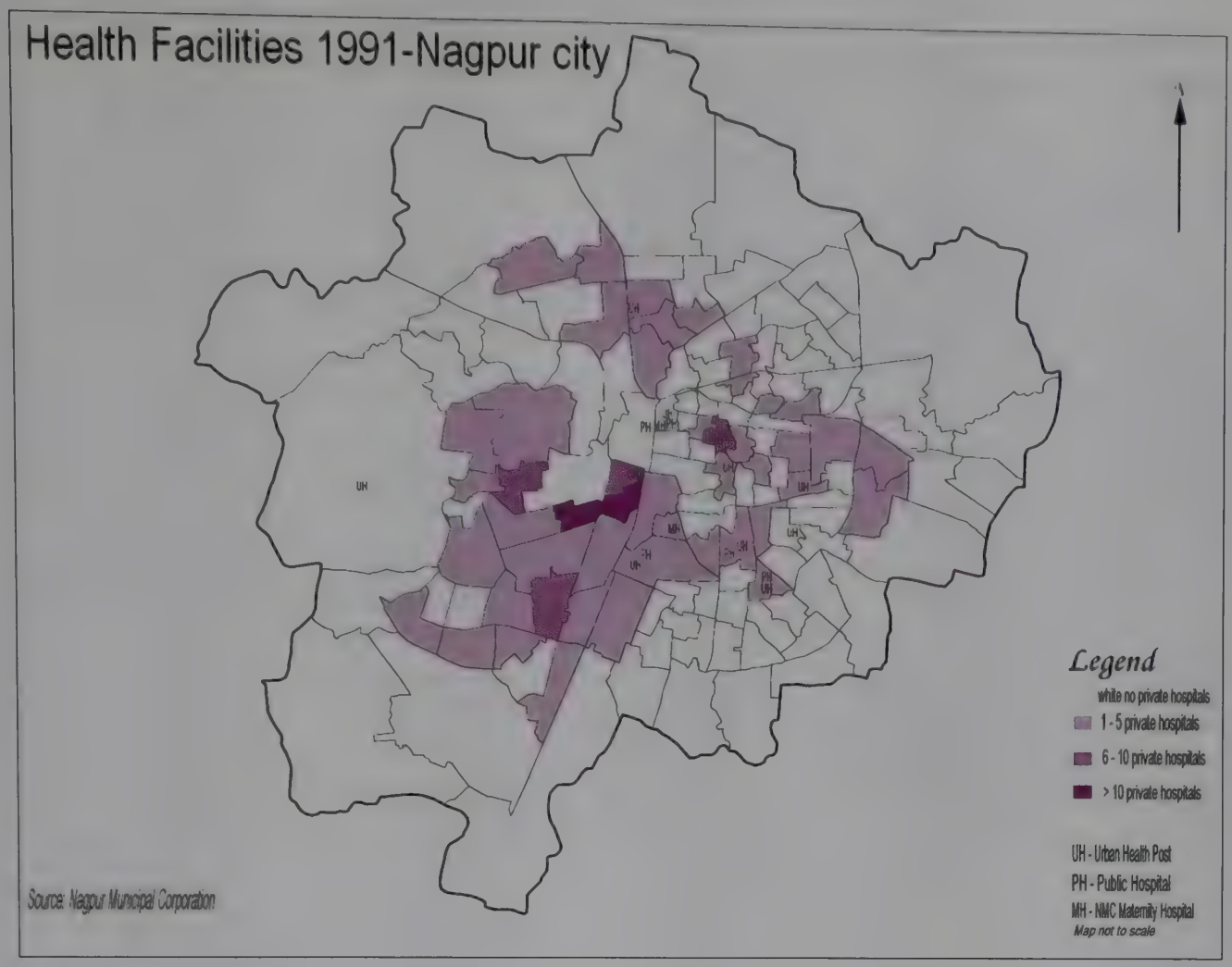
[22] Same source as footnote 19

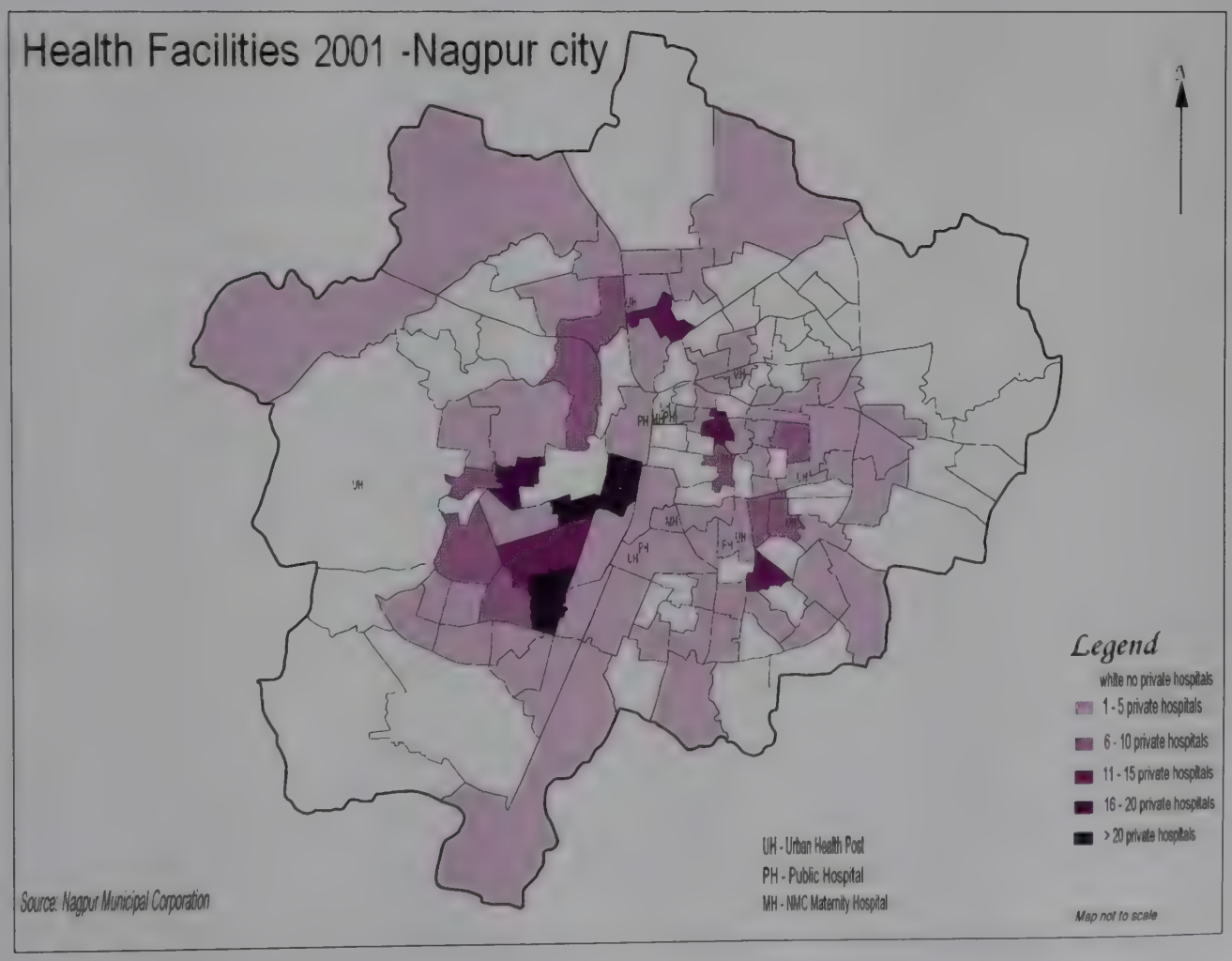
The economic condition of people makes it hard for people to access private hospitals. Lower economic strata patients cannot afford private facilities. So the poor go to BMS (Bachelor of Medicine and Surgery in Homeopathy) doctors and unqualified medical practitioners and then come to charitable trusts after being exploited by the private hospitals[23].

[23] Source: same as footnote 19

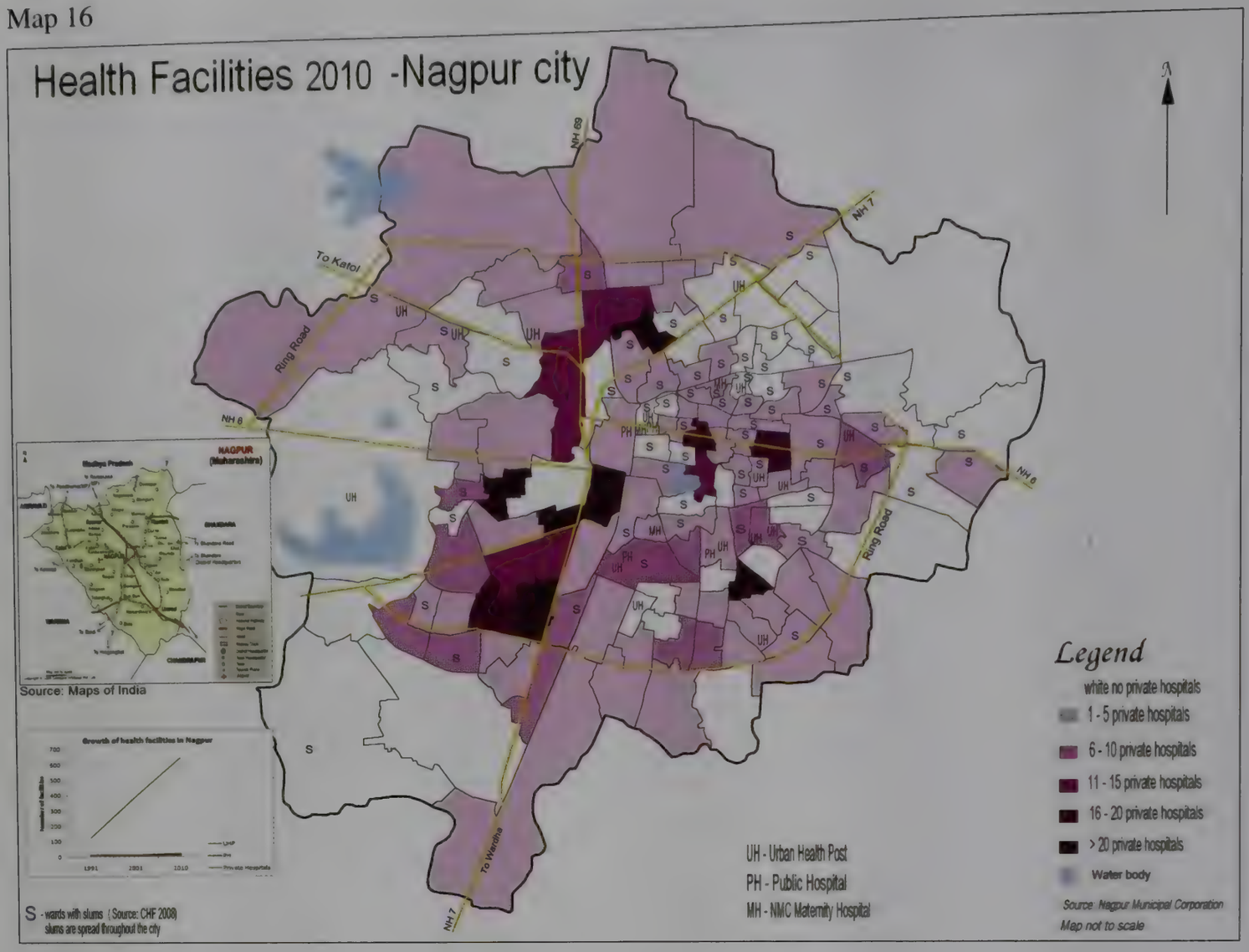
Map 14


Health Facilities 1991-Nagpur city
Legend
white no private hospitals
1 - 5 private hospitals
6 - 10 private hospitals
> 10 private hospitals
UH - Urban Health Post
PH - Public Hospital
MH - NMC Maternity Hospital
Map not to scale
Source: Nagpur Municipal Corporation

Map 15


Health Facilities 2001 -Nagpur city
Legend
white no private hospitals
1 - 5 private hospitals
6 - 10 private hospitals
11 - 15 private hospitals
16 - 20 private hospitals
> 20 private hospitals
UH - Urban Health Post
PH - Public Hospital
MH - NMC Maternity Hospital
Map not to scale
Source: Nagpur Municipal Corporation

Map 16


Health Facilities 2010 -Nagpur city
To Katol
NH 69
NH 7
Ring Road
NH 6
To Wardha
NAGPUR
(Maharashtra)
Source: Maps of India
Growth of health facilities in Nagpur
UH - Urban Health Post
PH - Public Hospital
MH - NMC Maternity Hospital
S - wards with slums (Source: CHF 2008)
slums are spread throughout the city
Legend
white no private hospitals
1 - 5 private hospitals
6 - 10 private hospitals
11 - 15 private hospitals
16 - 20 private hospitals
> 20 private hospitals
Water body
Source: Nagpur Municipal Corporation
Map not to scale

Discussion

The map analysis reveals that the location of public health facilities is clustered near the city centre, except for a few which are in the peripheral wards of the city.

Spatial accessibility has also been minimized due to the location of UHPs in EWs just outside EWs with a higher proportion of slum population as noted in Aurangabad. In Nashik, the location of many UHPs in the same precincts as the public hospital has not been conducive in making these accessible to the slum population. Also, in some cases in Nashik, two UHPs have been located in the same precincts as a public hospital. This spatial pattern of location again minimizes accessibility. A more widespread spatial distribution of UHPs will increase their access to the needy population.

The rapid growth of slum population at Aurangabad and Solapur, and the high slum population of Nagpur is a major concern. The needs of the urban poor and especially an increasing influx of migrants settling in unauthorized slums have to be tackled in Aurangabad, Solapur and Nagpur. This is evident spatially from the mapping exercise done in this study. There are pockets in the city which have less access to both public and private facilities. This is due to the health infrastructure being unevenly distributed within the cities. There is need to make provision of healthcare services accessible to the urban poor, especially for the poor living in unauthorised slums. Primary health care have been largely neglected in these cities, making it very difficult for the urban poor to access the public health care services that provide primary care from UHPs. The poor are forced to travel long distances to avail themselves of primary care services provided by the government.

The number of public hospitals has not grown much and has remained stagnant in Solapur and Nagpur. When the ratio of public facilities to the total city population is worsens, it conveys that the urban poor in these cities are finding 'accessibility' to public healthcare services increasingly difficult. This may be due to the tremendous increase in the growth of the slums.

Private health facilities, on the other hand, have grown tremendously. All the four cities have had a tremendous growth in the number of hospitals during the last two decades. There are EWs of hospital concentration in all the four cities. These concentrations have been induced largely by the location of higher and middle class residences within the cities. Besides, the growth of private facilities has taken place in wards surrounding those wards that already have good facilities. What is notable in the map analyses is the dearth of both public and private health facilities in the peripheral electoral wards of the city, well exemplified by Aurangabad, Solapur and Nagpur. This identifies the probable areas of need for facility location.

The ratios of private facilities have improved. Yet the geographical accessibility to health facilities for the population of the outlying wards has not changed much in the last two decades.

Distribution of healthcare facilities generally tend to be skewed in favour of developed areas. There tends to be a concentration of these in middle and upper middle class areas. This is even true of public hospitals, again raising issues of availability and accessibility to healthcare as noted by Baru (1998) and also evident from the spatial analysis of facilities done in this study.

An interesting feature noted in relation to the private health facilities in Aurangabad is that about 90 percent of the registered hospitals in the Bombay Nursing Home Registration Act list are also registered under the PNDT Act, while for Solapur and Nashik about 30 percent of the same private hospitals are in both the lists. This may mean that the PCPNDT Act may be better regulated in Aurangabad. Most of the private health facilities and also the municipal hospitals in Aurangabad cater primarily to maternal healthcare. This may explain why it has significantly higher CBR as compared to that in the other cities in this study, as provision of a better maternity service may attract a larger hinterland than otherwise.

The health of populations in an urban setting, where the population growth outstrips the provision of healthcare, needs to be addressed urgently. This scenario is true for Maharashtra, where cities having a population over 100,000 have been growing faster than the growth in healthcare.

There is need to define census ward areas by area names and/or by census ward maps by the Census of India within a city/urban area.At present the Census gives detailed population data by census wards within a city. But the location of the census ward is not given either by a map locating the ward within the city nor by the census ward name. This makes it difficult for a researcher to use the census data at the ward level as the ward cannot be geographically located. This was the reason the map analysis was done by electoral wards in this study.

The private sector has been dominant throughout and a rapid growth in this sector is evident. The study has mapped only small and large private and public hospitals. It is important to note that the dispensaries and clinics provide OPD care and remain unregistered and if they could be included, the scenario would completely change with a dominant presence of the 'private sector'.

Conclusion and Recommendations

There is an urgent need for the government to have a geographic norm for the location and number of private hospitals within a specific area in the city. This may help in the dispersal of facilities and may provide better access on an average, for the population in the urban fringe areas.

In India, the rural public health facility structure is well organized with clear cut population threshold norms. There are no such clear norms for the public health facility structure at the intra-urban level. The author suggests that as ICDS centres have data on the number and age of children at the local community level, these data could be used as a norm for the location of UHP/HC in urban areas as both ICDS and UHP/HC are geared towards providing health/nutrition services for the children of the urban poor.

The rapid growth of the slum population of Aurangabad and Solapur, and the high slum population of Nagpur are a cause of concern. The needs of the urban poor and especially an increasing influx of migrants settling in unauthorized slums (Aurangabad had almost 49% of its slum population living in undeclared slums in 2008 as reported by Aurangabad Municipal Corporation RCH official) have to be tackled. The government has health and sanitation improvement plans for authorised slums only. There is need to make provision of healthcare services accessible to the urban poor, especially to the poor living in unauthorised slums.

The government needs to address the healthcare needs of the urban poor. The talk of universal access to health for all, especially for the urban poor will go unheeded unless the government is serious about providing accessible and affordable healthcare facilities to the poor. This calls for effective action by the central government in cities with high concentrations of slums like Solapur and Nagpur. All these cities as of 2009 and 2010 has touched a million population and should be under the purview of JNNURM (Nashik and Nagpur already are). NUHM needs to take off with an emphasis to provide better access to the urban poor.

India needs to increase public health spending as it would be a fallacy to think that the present spending is adequate. There should be an increase in the number of locations of UHPs and public hospitals and they should be in proximity to the urban poor within the cities. Human resources need to be enhanced to support the accelerated growth in the urban and urban poor projected over the next few decades.

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Appendix

Facility: Population Ratios for the 4 cities

Table 1: Facility-Population ratios for Aurangabad city

UHP/Health Centres	1991	1994*	2001	2010*
Total Population	1: 81896	1: 66808	1: 43666	1: 61396
Public Hospitals				
Total Population	1: 191091	1: 222693	1:218328	1:161166
Private Hospitals (registration date)				
Total Population	NA	1: 6817	1: 4746	1: 3215
Beds				
Total	NA	NA	NA	1: 289
Public Hospitals	NA	NA	NA	1:1069
Private Hospitals	NA	NA	NA	1: 395
				2009*
PMP involved in immunization	NA	NA	NA	180
Doctors				
Total Population	NA	NA	NA	1: 648
Ultrasound Centres				
Total population	NA	NA	NA	1: 7065
Family Planning Surgery centres				
Total Population	NA	NA	NA	1: 12544
MTP Surgery Centres	NA	NA	NA	118
ICDS	NA	NA	NA	139

Source of basic data: Aurangabad Municipal Corporation.
BNHRA established in Aurangabad in 1994. PMP: private Medical Practitioners. NA data not available
** using projected population*

Table 2: Facility-Population ratios for Nashik City

Urban Health Posts	1991	1996*	2001	2009*
Total Population	1: 59720	1: 81431	1: 82864	1: 79541
Public Hospitals Total Population	1: 93846	1: 68903	1: 76945	1: 89484
Private Facilities Total Population	NA	1: 7109	1: 5855	1: 1937**
Ultrasound Centres Total Population	NA	NA	NA	1: 5773
Family Planning Surgery centres Total Population	NA	NA	NA	1: 10012

Source of basic data: Nashik Municipal Corporation (NMC).
BNHRA established in Nashik in 1996
**Using projected population*

***Private hospitals registered only from 1996 till 2010 (739 hospitals) used in the analysis as some hospitals had double registrations in the list given by NMC in 2009.*

Table 3: Facility-Population ratios for Solapur City

UHP	1991	2001	2010*
Total Population	1: 46478	1: 67114	1: 54391
Public Hospitals Total population	1: 50351	1: 72707	1: 86119
Private Hospitals (registration date) Total population	1: 8277	1: 6017	1: 3503
Beds			
Total	NA	NA	1: 188
Public hospitals	NA	NA	1: 814
Private hospitals	NA	NA	1: 244
MTP Surgery Centres	NA	NA	137

Source of basic data: Solapur Municipal Corporation (SMC)
** using 2010 projected population*

Table 4: Facility-Population ratios for Nagpur City

UHP	1991	2001	2010*
Total Population	1: 147705	1: 186551	1: 117523
Public hospitals			
Total Population	1: 203094	1: 228007	1: 274220
Private hospitals (registration date)			
Total Population	1: 13209	1: 5289	1: 8366
Beds (total)			
Total	NA	NA	1: 248
Public hospitals	NA	NA	1: 883
Private hospitals	NA	NA	1: 344

Source of basic data: Nagpur Municipal Corporation
**Using 2010 projected population*

Electoral Ward Analysis for the four Cities and Maps with Ward Numbers

Electoral ward map of Aurangabad city(2005)
Legend: numbers indicate electoral ward numbers
Source: Aurangabad Municipal Corporation

Electoral wardwise health facility locations for Aurangabad city

Electoral Ward No.	Municipal Ward Name of the Ward : Ward A	HC	PH	Private Hospitals 1994	2001	2010	Super Specialists 1994	2001	2010	USG	FP Surge.	ICDS	2001 EW Pop.
1	Harshul	A		1	1	2						4	9675
4	Wankhedenagar N-13											1	8057
5	Asifiya Colony Dilras Colony												9060
6	Begumpura			1	1	1						5	9076
7	Bhavsingpura	A			1	1						10	8862
8	Padegaon			1	1	1			1	1	1		8494
9	Shantipura					1				1			8893
10	Daisingpura					1					1	2	8931
11	Bhadkalgate		A	1	2	7			1	2	1		9465
12	Ghati Parisar Asifiya Colony									1		8	9388
13	Vishwasnagar				1	6						4	8297
30	Harshnagar	C				1						7	8409
31	Lotakaranja Chelipura												8794
32	Kabadipura, Chowk, Buddhilane	D	A	3	4	6			1	2	1		8725
34	Khadkeshwar	B		2	6	9		2	2	12	5	2	8921
35	Kotwalpura	C			1	4			1	2		8	8740
	Totals	**6**	**2**	**9**	**18**	**40**	**0**	**2**	**6**	**21**	**9**	**51**	**141787**

Source: Aurangabad Municipal Corporation (PNDT&BNHRA lists) lists of 2009 and Feb. 2010 respectively).

Main slum wards: 6,7,9,10,13,30

Electoral wardwise health facility locations for Aurangabad city

Electoral Ward No.	Municipal Ward Name of the Ward : Ward B	HC	PH	Private Hospitals 1994	2001	2010	Super Specialists 1994	2001	2010	USG	FP Surge.	ICDS	2001 EW Pop.
2	Mayur Park, Jadav Wadi												9524
3	Yadhavnagar N-11	C	D	1	4	11			3	3	3	1	8911
14	Roza Bagh			1	1	2			1				9118
15	Swami Vivekanandanagar			1	2	3				1	1		8062
16	Mayur nagar, Sudarshannagar					1							8897
17	Shrikrishnanagar												9129
18	Pawannagar				2	8			1	11	6	2	9083
19	Sivneri Colony, Mhada Colony			2	2	2					1		8989
20	Ambedkarnagar												9124
21	Misarwadi Naregaon												8456
22	Naregaon	B											9497
24	MIDC Chikalthana		A	5	5	7				10	6	8	8105
25	Ayodhyanagar					2							8550
26	Ganeshnagar		C	2	2	6			1	3	3	1	8432
47	N-6 CIDCO					4		1	1	2	2		9241
48	Avishkar Colony			2	2	5			1				9428
49	Gulmohar Colony, Satayam Nagar									1	1		8771
	Totals	**2**	**3**	**14**	**20**	**51**	**0**	**1**	**8**	**31**	**23**	**12**	**151317**

HC at ward 3 upgraded to AMC hospital 2009

Main slum areas: 20,22

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Electoral wardwise health facility locations for Aurangabad city

Electoral Municipal Ward Ward No.	Name of the Ward : Ward C	HC	PH	Private Hospitals 1994	Private Hospitals 2001	Private Hospitals 2010	Super Specialists 1994	Super Specialists 2001	Super Specialists 2010	USG	FP Surge.	ICDS	2001 EW Pop.
27	Shatabdi Nagar												8433
28	Nehrunagar				1	4							8785
29	Ganesh Colony				2	3				1	1		8659
40	Nawabpura												8566
41	Shahbazar				3	9		1	2	1			8911
42	Roshangate Maqsood Colony				1	4			1	3	1	2	9113
43	Sharif Colony					1							9025
44	Kiradpura				2	2						4	9196
45	Rehmaniya Colony											1	9543
46	Altamash Colony					3			1				9803
51	Indira nagar (S) Baijipura	A			3	5			1			6	9599
52	Indira Nagar (N) Baijipura			2	3	4						4	9786
53	Bari Colony					1							8661
54	Sanjay nagar												8656
55	Kaisar Colony	C	D			1							9523
56	Sanjay Nagar, Jinci	A										2	9752
57	Bhawani Nagar	D			1	4			1			3	9385
	Totals	**4**	**1**	**2**	**16**	**41**	**0**	**1**	**6**	**5**	**2**	**22**	**155396**

Main slum areas: 28, 51, 52

Electoral wardwise health facility locations for Aurangabad city

Electoral Municipal Ward Ward No.	Name of the Ward : Ward D	HC	PH	Private Hospitals 1994	Private Hospitals 2001	Private Hospitals 2010	Super Specialists 1994	Super Specialists 2001	Super Specialists 2010	USG	FP Surge.	ICDS	2001 EW Pop.
33	Gulmandi			3	3	3							8060
36	Nageshwarwadi, Bhoiwada			1	1	1				1			9179
37	Aurangapura, Paithangate			4	5	5	1		1	2	2		8677
38	Gandhinagar			2	3	3				1	1		9110
39	Rajabazar			3	3	3	1			3	4		9169
58	Kailasnagar	A				1			1	1	1	5	9158
59	Ajabnagar, Khokadpura			2	4	6			1	3	3	2	9703
60	Sillekhana			3	3	11	1	1	3	5		4	8616
61	Samarthnagar	C		15	21	37	4	6	15	15	6		8708
62	Kotla Colony			1	2	5		1	2	3	2		8232
63	Kokanwadi			6	8	12				3	1	2	8850
64	Krantichowk	A		2	5	14	1	3	6	6	3	7	8174
65	Ramnagar			2	3	8		1	1	4	2	4	8237
91	Osmanpura	D		2	4	12	1	2	4	4	2		8292
94	Bansilalnagar	C	D		2	6			1	1	2	5	8577
95	Padampura			3	3	6			1	4	3	5	8565
	Totals	**5**	**1**	**49**	**70**	**133**	**9**	**14**	**36**	**56**	**32**	**34**	**139307**

HC at ward 94 upgraded to AMC hospital 2009

Main slum areas: 65, 95

Electoral wardwise health facility locations for Aurangabad city

Electoral Ward No.	Municipal Ward Name of the Ward : Ward E	HC	PH	Private Hospitals 1994	2001	2010	Super Specialists 1994	2001	2010	USG	FP Surge.	ICDS	2001 EW Pop.
23	Masnatpur, Chikalthana					1							9236
70	Vidyanagar			2	6	12			2	5	3	5	9381
71	Nayanagar									2			8415
72	N-3, N-4, CIDCO			1	2	15			2	6	2		8999
73	S.T. Colony, N-2, CIDCO			1	2	8			1	5	2		8083
74	Dnyaneshwar Colony, Mukundwadi					4				1			9182
75	Sanjay Nagar, Mukundwadi					1							9044
76	Ramnagar									1			8769
77	Kamgar Colony, Vithalnagar												9229
78	Chikalthana	A				1							9795
79	Mukundwadi	C				1							9389
80	Ambikanagar, Mukundwadi												8800
81	Jaibhawaninagar, CIDCO												8364
82	Bharatnagar, Matoshrinagar, Garkheda					4							8981
83	Pundliknagar					1			1				8719
84	Kalpataru Colony, Balkrishnanagar												9201
	Totals	**2**	**0**	**4**	**10**	**48**	**0**	**0**	**6**	**20**	**7**	**5**	**143587**

Main slum areas: 75, 78, 79

Electoral wardwise health facility locations for Aurangabad city

Electoral Ward No.	Municipal Ward Name of the Ward : Ward F	HC	PH	Private Hospitals 1994	2001	2010	Super Specialists 1994	2001	2010	USG	FP Surge.	ICDS	2001 EW Pop.
50	Surananagar			6	11	20	1	1	4	10	4		8086
66	Shivshankar Colony			3	5	9		1	1	3	1		8382
67	Boudhnagar, Uttamnagar									1	1		8367
68	Vishnunagar			3	5	13		2	4	5	3		9778
69	Jawahar Colony	B		2	4	17		2	4	12	4	3	8762
85	Garkheda					2				1			9079
86	Priyadarhani, Indira nagar												9018
87	Ulkanagari				1	3			1	2			8516
88	Jaivishwabharati Colony	C											8756
89	Jyotinagar				1	3				2	1		8939
90	Eknathnagar	D				1						4	9112
92	Kabirnagar											4	9139
93	Vedantnagar			2	5	7	1	3	3	2	3	2	8087
96	Hamakwada Rly. Station	C	D									2	9542
97	Banewadi												8637
98	Nakshatrawadi	C		2	2	5			1	3	1		9717
	Totals	5		18	34	80	2	9	18	41	18	15	141917

HC at ward 96 upgraded to AMC hospital 2009

Main slum areas: 92

Electoral wardwise health facility locations for Aurangabad city

	HC	PH	Private Hospitals 1994	Private Hospitals 2001	Private Hospitals 2010	Super Specialists 1994	Super Specialists 2001	Super Specialists 2010	USG	FP Surge. centres	ICDS	2001 EW Pop.
TOTALS (those located)	21	8	98	183	393	10	33	91	174	91	139	873311
Totals on the facility list that were working	21	8	98	184	401	10	33	95	174	98	139	

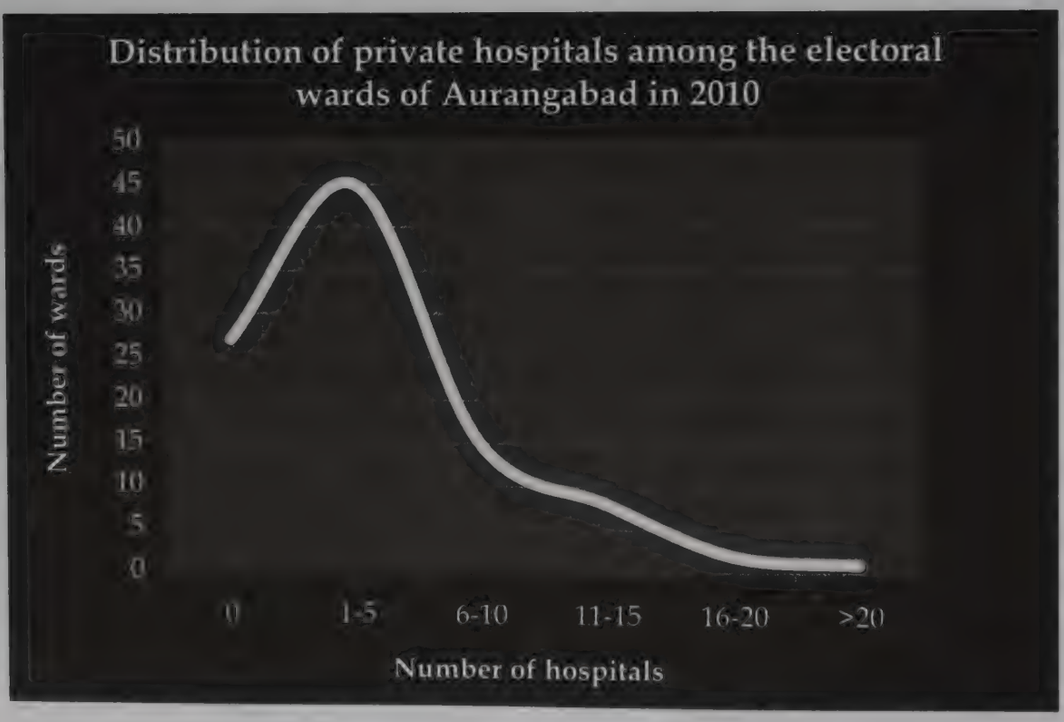
Legend:
Health Centre (HC)/Public Hospital Establishment Year:
A=1991, B=1994, C=2001, D=2009/10

(3 HCs upgraded to hospital in 2009)

HC- Health Centre
PH-Public Hospital
Pvt.H-Private Hospital (all private health facilities locations that were found)
SS-Super Specialist(those with a single speciality)
USG-Ultrasonography centres
FP Surge.-Family Planning Surgery centres
ICDS-Integrated Child Development Services locations

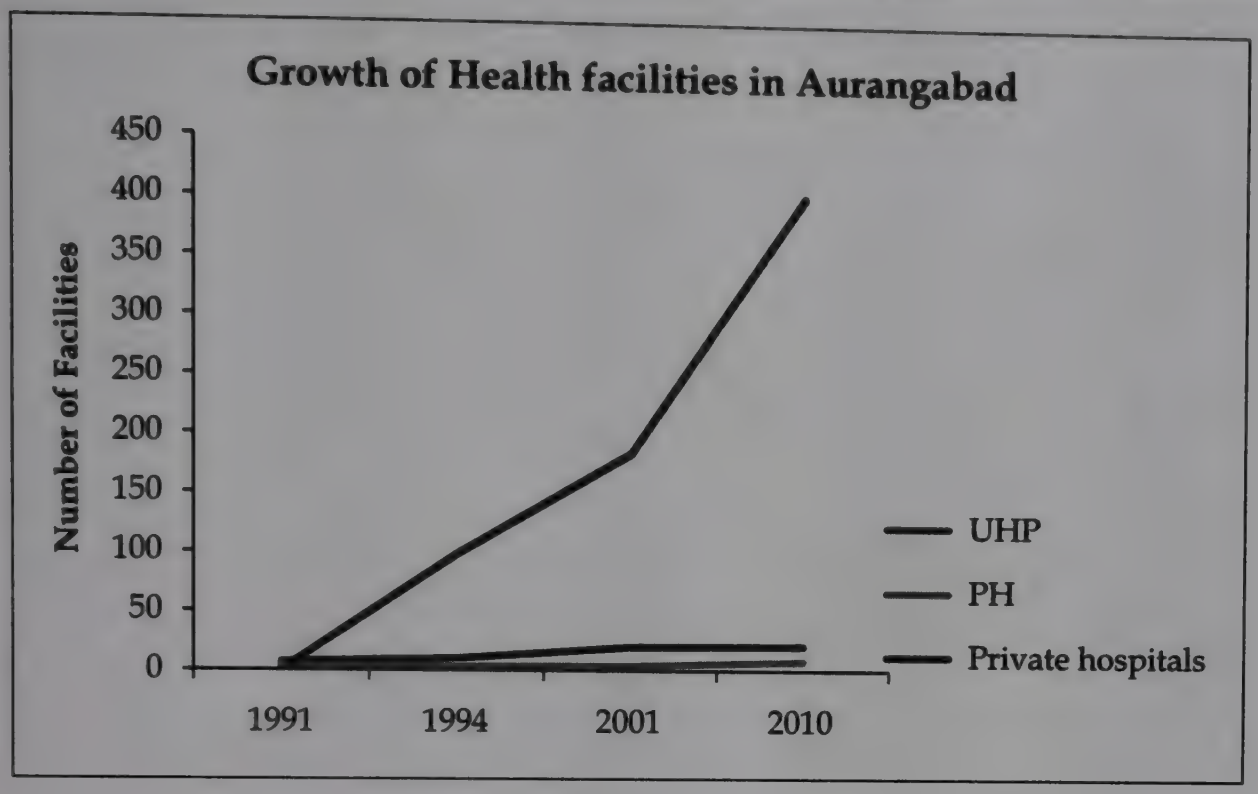
Distribution of Private Facilities among the electoral wards of Aurangabad

Number of hospitals (class)	0	1-5	6-10	11-15	16-20	> 20
Number of wards	27	45	15	8	2	1

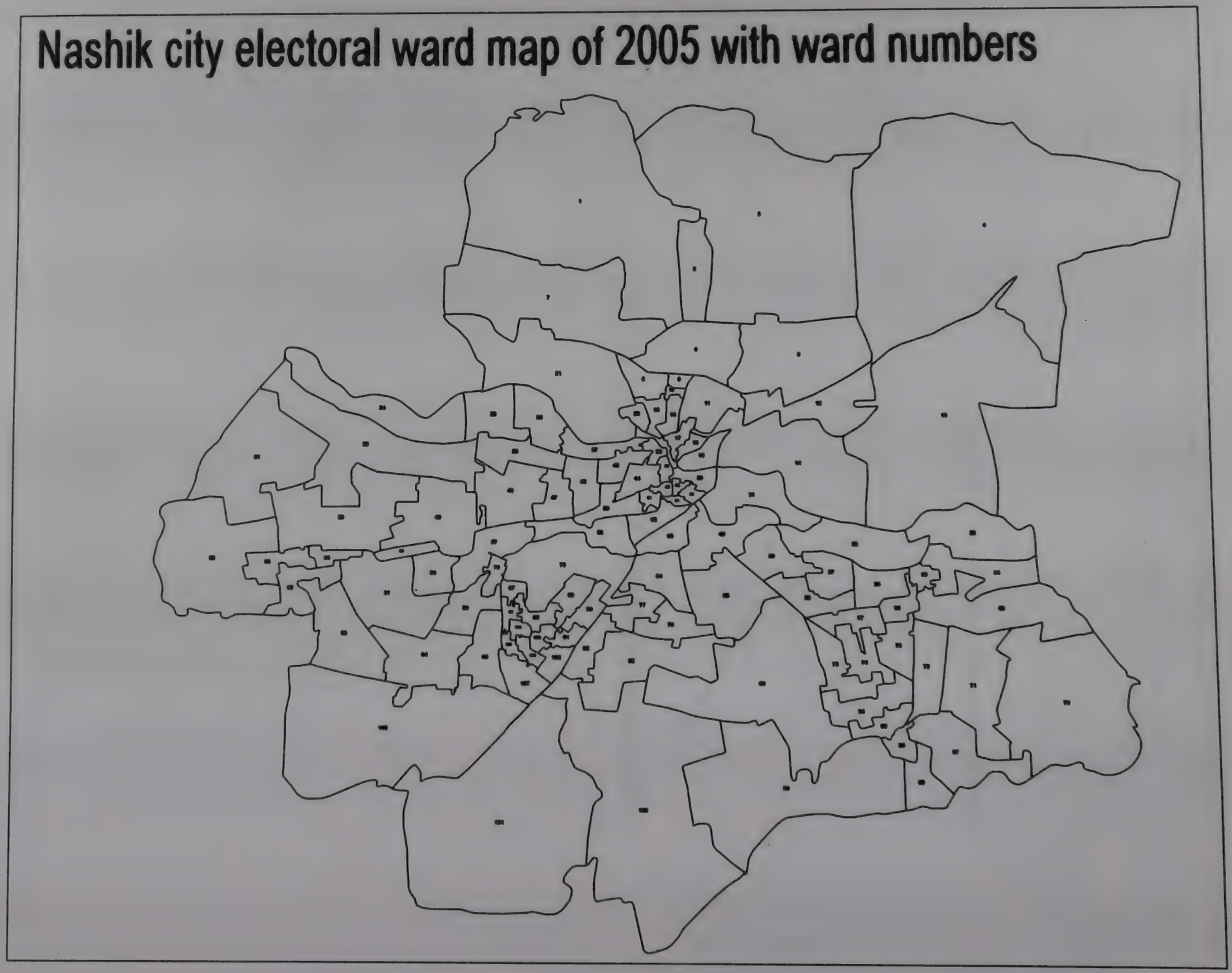


Trend Line showing the growth of Public and Private health Facilities in Aurangabad

Facilities	1991	1994	2001	2010
UHP	7	10	20	21
PH	3	3	4	8
Private hospitals	NA	98	184	401



Nashik city electoral ward map of 2005 with ward numbers



Nashik Municipal Corporation electoral wards 2005

EW No.	Administration ward name: Nashik East	Public Facilities UHP	Disp.	MH	PH	Private Facilities 1996	2001	2009	USG 2009	FPS 2009	Population 2001
30	Gadje Maharaj		1								10729
31	Tigrania					1	1	6		1	9772
37	Ramdas Colony							1			10567
38	Ambedkar Nagar	D		B		2	2	8	1	1	10276
39	Panchasheel Colony							3			9712
40	General Vaidya Nagar						1	16		2	9329
41	Kathada Market Area	C=2			C	1	3	6		1	10308
42	Budhwarpet							1			10390
43	Phule Market							1			9902
60	Ganjmal Area					2	3	5	3	2	10032
61	Motha Rajwada										10236
62	Gurudwara Road						1	1	1	1	10693
63	Bhaba Nagar					2	4	16			9450
64	Deepali Nagar							1	1		10002
65	D. G P Nagar							1			9616
76	Wadala Area					1	1	3	1	1	9363
77	Indira Nagar, Rajsarthi						3	14		2	9618
92	Rajeev Nagar							7	2	0	9810
	Total	**3**	**1**	**1**	**1**	**9**	**19**	**90**	**9**	**11**	**179805**

Legend

NMC facilities established before/by
A 1991 or before
B by 1996
C by 2001
D by 2009
UHP-Urban Health Post
Disp.-Govt. dispensary
MH-NMC Maternity Hospitals
PH-NMC general hospitals/other government hospitals
USG-Ultrasonography centres
FPS-Family Planning Surgery Centres

1996=9 (registered in 1996 under BNHRA)
2001=13 (registered from 1997-2001)
2009=71(registered after 2001)
Private hospitals cumulated from 1996

Slums in Ganjamal ward

NOTE: BNHRA list, only those registered till 2010 used in the analysis to avoid duplication of private hospitals

Nashik Municipal Corporation electoral wards 2005

EW No.	Administration ward name: Nashik West	Public Facilities UHP	Disp.	MH	PH	Private Facilities 1996	2001	2009	USG 2009	FPS 2009	Population 2001
22	Pumping Station					2	4	7	2	3	9461
23	Narsinha Nagar							4			10444
26	D'Sauza Colony					3	7	20	3	1	10337
27	KTHM College Area					1	1	7	2	3	9259
28	Ravivar Kamja Area	D	2	B		7	9	21	6	4	10399
29	Badrakali Mandir Area										10365
44	Highschool Ground	A=1/D=1				12	14	31	4	3	9538
45	Gole Colony			B		14	17	43	12	13	10298
46	Tilakwadi					20	26	73	13	7	9603
47	Sharanpur Gothan							5			10783
48	PTC Area						1	3		1	10695
58	Tupsakhare Lawn					1	1	18	3	1	9884
59	Panchashil Nagar	A=2*			A*	4	6	13	2	4	10146
	Total	**5**	**2**	**2**	**0**	**64**	**86**	**245**	**47**	**40**	**131212**

** Civil hospital and multi speciality government hospital*

Slums in ward 29 and Kathda area along the canal, old railway line in central Nashik

1996=64
2001=22
2009=159

Nashik Municipal Corporation electoral wards 2005

EW No.	Administration ward name: Satpur	Public Facilities UHP	Disp.	MH	PH	Private Facilities 1996	2001	2009	USG 2009	FPS 2009	Population 2001
24	Gangapur Area	A			D, A*	1	1	6			10209
25	Balwant Nagar							1			9192
49	Mahatma Nagar			B		3	4	8			10266
50	MICO Area	A						5			9391
51	Shivaji Nagar						2	3			10647
52	Shramik Nagar							1			10265
53	Ashok Nagar Colony						1	6		2	10140
54	Maharashtra Housing		1				1	6	1		9371
55	Satpur Divisional Office				A*			1			9423
56	Swarbaba Nagar										9524
81	AzadNagar Area							2			9566
82	Pimpalgaon Bahula	D	1					1			9461
83	Chunchale Area							4		1	9844
	Total	**3**	**2**	**1**	**1**	**4**	**9**	**44**	**1**	**3**	**127299**

Slums in Satpur along Trimbak Road

1996=4
2001=5
2009=35

Nashik Municipal Corporation electoral wards 2005

EW No.	Administration ward name: Panchavati	Public Facilities UHP	Disp.	MH	PH	Private Facilities 1996	2001	2009	USG 2009	FPS 2009	Population 2001
1	RTO Office Area							6	1	4	9775
2	Dindori Road Area						1	5	1		10196
3	Mhasrul Gaothan							4		2	9101
4	Adgaon Area					2	2	7	2	1	9314
5	Hirawadi Area							2		3	9987
6	Meri Area							2		1	9977
7	Makhamalabad Gaothan							1			10824
8	Datta Nagar							2			10101
9	Takkarmal Area							4			9843
10	Bharad Wadi							5	1	2	9106
11	Mahalaxmi Theatre Area						3	9	2	4	9306
12	Manuman Nagar							1			9737
13	Nadur Mannur							2			9277
14	Tapovan Area					2	2	11	2	1	9342
15	Ganeshwadi				A*		1	5	1		9468
16	Ram Mandir Area							1			9504
17	Sardar Chowk Area	A			D		1	11	1	5	9582
18	Indra Kund Area	A	1			5	6	13	5	1	10340
19	Rajpal Colony Area					1	2	7			9183
20	Kranti Nagar						1	4			10749
21	Ramwadi Area							1			10755
	Total	**2**	**1**	**0**	**1**	**10**	**19**	**103**	**16**	**24**	**205467**

1996=10
2001=9
2009=84

Slums are along Godavari River in wards of Badrakali, Dindori and Peth Roads and in Panchavati

Nashik Municipal Corporation electoral wards 2005

EW No.	Administration ward name: CIDCO	Public Facilities UHP	Disp.	MH	PH	Private Facilities 1996	2001	2009	USG 2009	FPS 2009	Population 2001
57	Khutwadnagar					2	3	4			9450
78	Govind Nagar					1	4	17	1	2	9332
79	Navjeevan Public School					1	4	19		1	9220
80	Vrindavan Nagar						2	4		1	9372
84	DGP Nagar no. 2							5			9657
85	Shubham Park						1	4		2	10273
86	Raigad Chowk					1	1	10			9570
87	Patil Nagar						1	10	1		9427
88	Mahale Mala						1	2			9524
89	Tulaja Bhawani Chowk	A						4			9404
90	Sunderban Colony					1	1	6	1	3	9239
91	Ganesh Chowk					1	1	3	2		9789
93	Ekata Nagar Area										10770
100	Pathardi Area							2			10942
101	Phalake Smarak							2			10308
102	Pelikan Park	D			B	2	5	12		3	9623
103	Datta Chowk					2	3	7	1	2	9531
104	Sai Baba Nagar					1	1	7		1	10174
105	Uttam Nagar							10		2	9376
106	Morwadi Area							2		1	9471
107	Ashwin Nagar						1	6			10259
108	Ambad Gaon Area							10		1	10772
	Total	**2**	**0**	**0**	**1**	**12**	**29**	**146**	**6**	**19**	**215483**

Slums in 108 ward
Raju Nagar

1996=12
2001=17
2009=117

Nashik Municipal Corporation electoral wards 2005

EW No.	Administration ward name: Nashik Road	Public Facilities UHP	Disp.	MH	PH	Private Facilities 1996	2001	2009	USG 2009	FPS 2009	Population 2001
32	Dasak Agartakli Area	A		B						2	9724
33	Panchak Area							1			10588
34	Takekar Vasahat							4			10533
35	Konark Vihar Parisar						1	2			9035
36	Narayan Bapu Nagar							1		1	9123
66	Artillery Centre Road							3			13805
67	Amrapali Slum										10032
68	Ingale Nagar							2			9364
69	Central Jail Premises						1	2			10731
70	Chehadi Chadegaon							1			10287
71	Sinnar Patta Parisar	A=2		A	A	2	3	5	3	2	10153
72	Distilary Quarter					3	5	7	2		10516
73	Motwani Factory Area					2	2	5	2	1	10732
74	Nehru nagar, Shikhareawadi				A*	1	2	5	1	1	10374
75	Jaibhavani Road Parisar							2			10536
94	Dhongale Mala					3	4	15	3	2	10496
95	Rokadoba Wadi							1			10607
96	Deolali Gaon					2	2	7	1	2	9953
97	Pawar Wadi										10619
98	Ramabai Ambedkar Nagar,							2		1	10400
99	Vihitgaon Parisar					3	3	4			10362
	Total	**3**	**0**	**2**	**1**	**16**	**23**	**69**	**12**	**12**	**217970**

1996=16
2001=7
2009=46

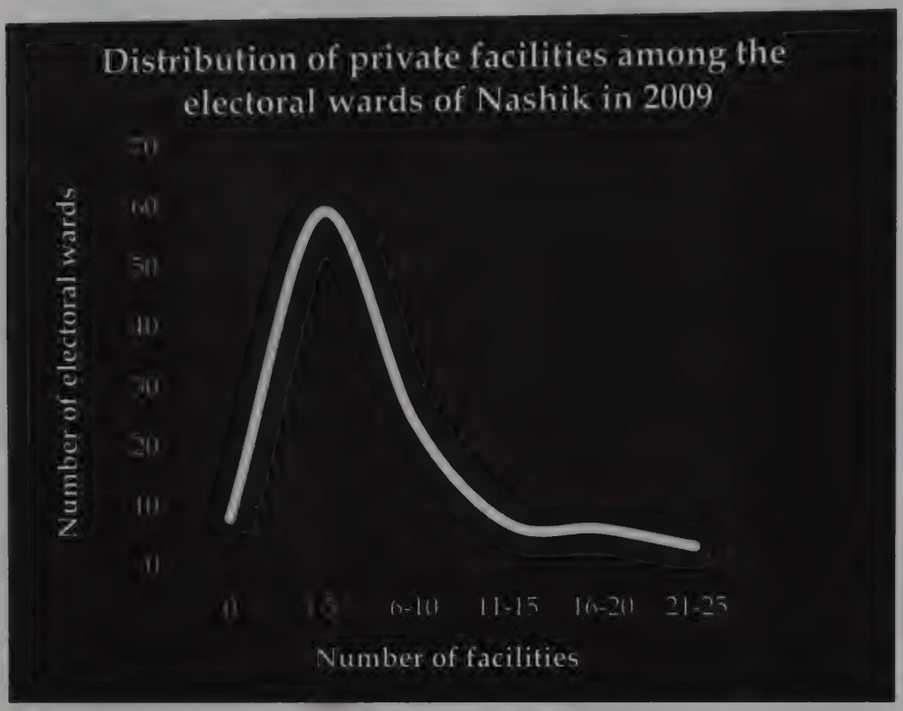
Note:
2 dispensaries could not be located
11 USG centres could not be located
32 FPS centres could not be located
42 Private hospitals could not be located
** The data also includes 4 state and 1 central government hospital all established before 1991*

Slums: Amrapalli slum, slums north of Nashik Road

Area Populations	
Nashik E	*179805*
Nashik W	*131212*
Satpur	*127299*
Panchavati	*205467*
CIDCO	*215483*
Nashik Road	*217970*
Total	*1077236*

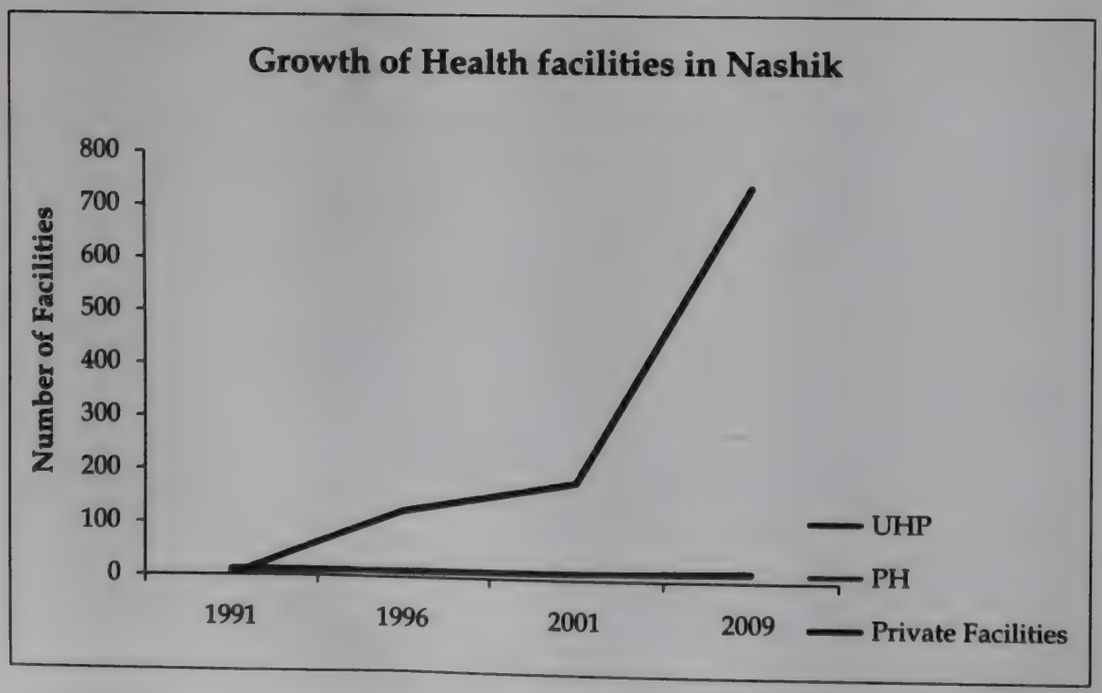
Distribution of Private Facilities among the electoral wards of Nashik

Number of hospitals (class)	0	1-5	6-10	11-15	16-20	21-25
Number of wards	8	59	24	7	6	3

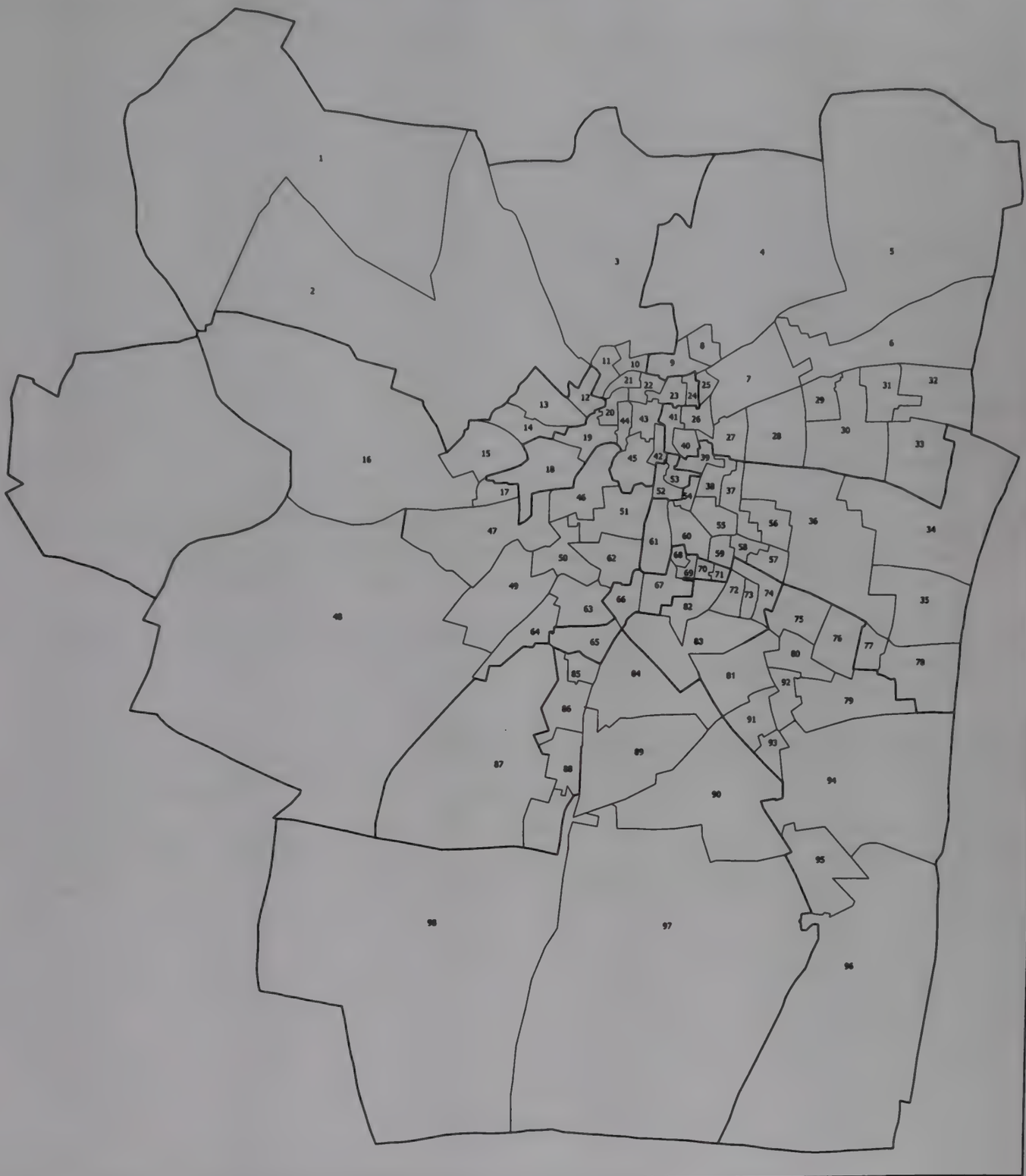


Trend Line showing the growth of Public and Private health Facilities in Nashik

	1991	1996	2001	2009
UHP	11	11	13	18
PH	7	13	14	16
Private Facilities	NA	126	184	739



Solapur city electoral ward map of 2005 with ward numbers



Solapur Municipal Corporation electoral wards 2005

EW No.	Administration ward name: Zone 1	Public Facilities UHP	Mun. Disp.	MH	PH	Private hospitals By 1991	2001	2010	Population 2001
									8627
1	Shivaji Nagar, Kegaon					2	2	3	8922
2	Kasbe, Budwarpet					1	3	7	8823
3	Shelgi, Bhawanipeth								8871
10	Bagale Vasti							1	9166
11	Ambedkar Nagar etc					2	5	5	9010
18	Murarjipeth					2	9	18	9146
19	Murarjipeth								9236
20	Budhwarpeth					2	3	3	8472
21	Budhwarpeth					3	3	3	9312
22	West Mangalwarpeth								8734
23	Bhawanipeth								8024
24	Bhawanipeth					3	5	8	9257
42	Sukrawarpeth					6	10	16	8941
43	South Kasbe, etc	A, A	2	A		7	11	13	9374
44	N & S Kasbe					5	6	10	8406
45	Sidheswarpeth								
	Total	**2**	**2**	**1**	**0**	**33**	**57**	**87**	**142321**

Legend
SMC facilities established before/by
A 1991 or before
B RCH-UHP established by 2004
UHP-Urban Health Post
MH-SMC Maternity Hospitals
PH - Public Hospitals

Note: Solapur has multiple electoral wards with same name. The private hospital list only has ward name, not street address. A few locations maybe therefore approximate.

Solapur Municipal Corporation electoral wards 2005

EW No.	Administration ward name: Zone 2	Public Facilities UHP	Mun. Disp.	MH	PH	Private hospitals By 1991	2001	2010	Population 2001
4	Shelgi, Bhawanipeth	B				5	7	9	9347
5	Dahitane, Shelgi								9151
6	Dahitane, Shelgi								9593
7	Dayanand College,etc	A							9527
8	Bhawanipeth								9066
9	Shahi Vasti, etc								8941
25	Bhawanipeth, etc								9332
26	Jodbhavipeth	A, A	1	A		1	2	5	9554
27	Ravivarpeth, etc		2			1	4	11	8933
28	Gandhi Nagar, etc		1						9481
29	Vidi Gharkul							1	8742
30	Vidi Gharkul							1	9186
31	Vidi Gharkul								8155
32	Vidi Gharkul	B							9165
33	Yashwant Mill								8666
40	Sakharpeth					1	1	2	8715
41	East Mangalwarpeth	A	1	A		1	2	6	9114
	Total	**6**	**5**	**2**	**0**	**9**	**16**	**35**	**154668**

Slums (main areas): wards 26, 27, 40

Solapur Municipal Corporation electoral wards 2005

EW No.	Administration ward name: Zone 3	Public Facilities UHP	Mun. Disp.	MH	PH	Private hospitals By 1991	2001	2010	Population 2001
34	Kasbe					1	1	2	8943
35	Kasbe								8837
36	MIDC, etc						3	3	8177
37	Pachapeth					2	2	2	9221
38	Bhadravatipeth						1	2	8944
39	Sakharpeth, etc					1	1	3	9442
54	Muslim Pachapeth					1	1	2	8432
55	Pachapeth			A				3	8903
56	Pachapeth					1	1	1	8346
57	Pachapeth								8156
58	Pachapeth								8235
59	Pachapeth, etc					1	3	4	8899
60	N. Sadar Bazar	A	1		A, A				9253
61	N&S Sadar Bazar					2	2	3	9447
77	Majarewadi,etc							1	8661
78	Nilam Nagar							1	8566
	Total	**1**	**1**	**1**	**2**	**9**	**15**	**27**	**140462**

Slums (Main areas): 35, 37, 38, 39, 61,77

Solapur Municipal Corporation electoral wards 2005

EW No.	Administration ward name: Zone 4	Public Facilities UHP	Mun. Disp.	MH	PH	Private hospitals By 1991	2001	2010	Population 2001
72	N&S Sadar Bazar		1			1	2	2	8618
73	Indira Nagar, etc								9474
74	S. Sadar Bazar, Kumtha					1	3	4	8539
75	Majarewadi					1	1	2	8958
76	Majarewadi								9415
79	Majarewadi	B							8564
80	Majarewadi								8881
81	Antrolikar Nagar						1	3	8910
82	Civil Lines						1	2	8968
83	Civil Lines				A	1	4	5	8330
91	Hotgi Road, etc							4	9660
92	Majarewadi								8267
93	Hotgi Road, etc								8463
94	Vimantal							1	8947
95	Majarewadi, kumthe							1	9442
96	Kumthe, Majarewadi								9587
	Total	**1**	**1**	**0**	**1**	**4**	**12**	**24**	**143023**

Slums (main areas): 75, 76, 79, 80, 92, 96

Solapur Municipal Corporation electoral wards 2005

EW No.	Administration ward name: Zone 5	Public Facilities UHP	Mun. Disp.	MH	PH	Private hospitals By 1991	2001	2010	Population 2001
65	Revansidheshwar Temple								8161
66	Modi Civil Lines						1	2	9674
67	S. Sadar Bazar		1	A		1	3	6	9397
68	N. Sadar Bazar								9206
69	N&S. Sadar Bazar					1	1	1	9286
70	Shastri Nagar						1	1	9146
71	Shastri Nagar						1	1	9439
84	Vijapur Road, etc					1	2	8	9167
85	Garibi Hatao Zopadpatti	A							8395
86	Indira Nagar		1					1	8118
87	Nehru Nagar					1	8	13	8458
88	Nehru Nagar								8613
89	Jule Solapur, Vijapur Road					1	1	4	9621
90	Jule Solapur	B						1	8543
97	SRP Camp, etc								8335
98	Pratap Nagar, Soregaon	B							8559
	Total	**3**	**2**	**1**	**0**	**5**	**18**	**38**	**142118**

Slums (main areas): 85, 66

Solapur Municipal Corporation electoral wards 2005

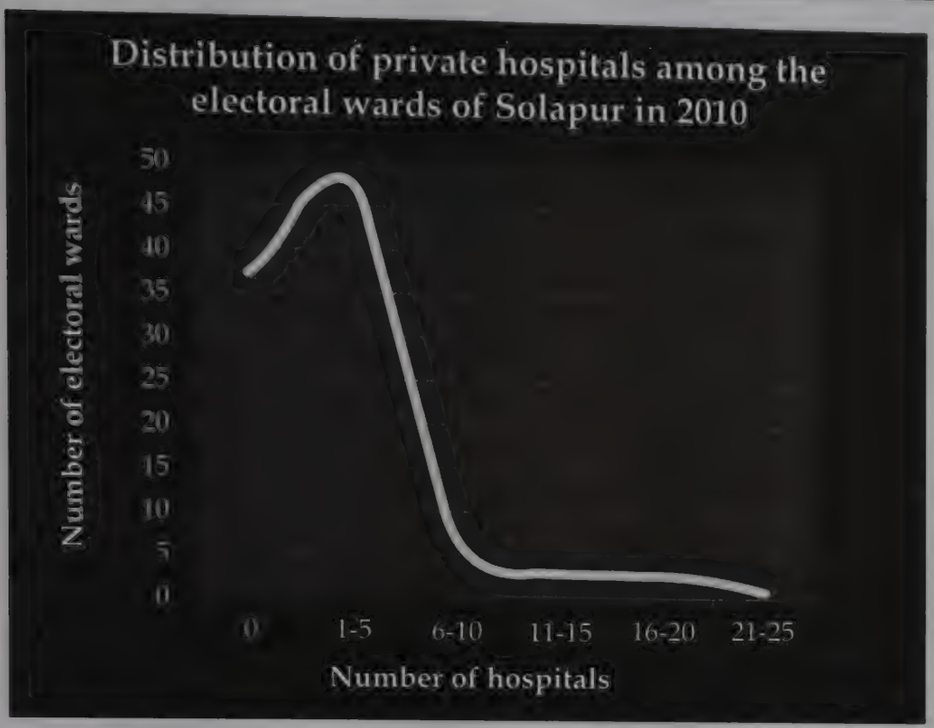
EW No.	Administration ward name: Zone 6	Public Facilities UHP	Mun. Disp.	MH	PH	Private hospitals By 1991	2001	2010	Population 2001
12	Budhwarpeth					1	1	2	8303
13	Budhwarpeth							1	8974
14	Nirale vasti								8536
15	Laxmipeth								8529
16	Laxmipeth, etc							1	8191
17	Laxmipeth							3	9013
46	Railway Lines				A	5	10	21	8818
47	Laxmipeth		1						8189
48	Degaon								8398
49	Limayewadi						1	1	9535
50	Ramwadi	A		A		1	2	2	9354
51	Railway Lines	A,A,B	1	A		5	9	19	8379
52	Begumpeth, Siddes.						1	2	9128
53	Shaniwarpeth		1	A		1	2	4	8799
62	Railway Lines	A, A						3	8883
63	Modo HUDCO								9283
64	Bharu vasti						1	1	9494
	Total	**6**	**3**	**3**	**1**	**13**	**27**	**60**	**149806**

Slums (main areas) 46, 53

Total Private hospitals = 295
Not Found = 24

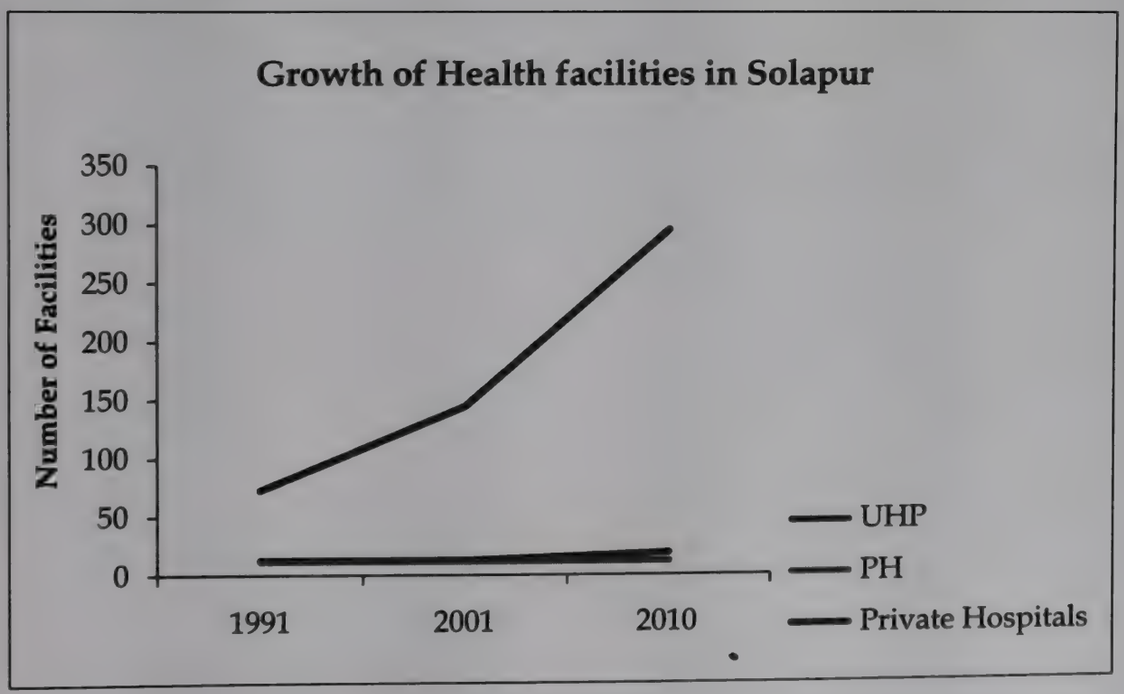
Distribution of Private Facilities among the electoral wards of Solapur

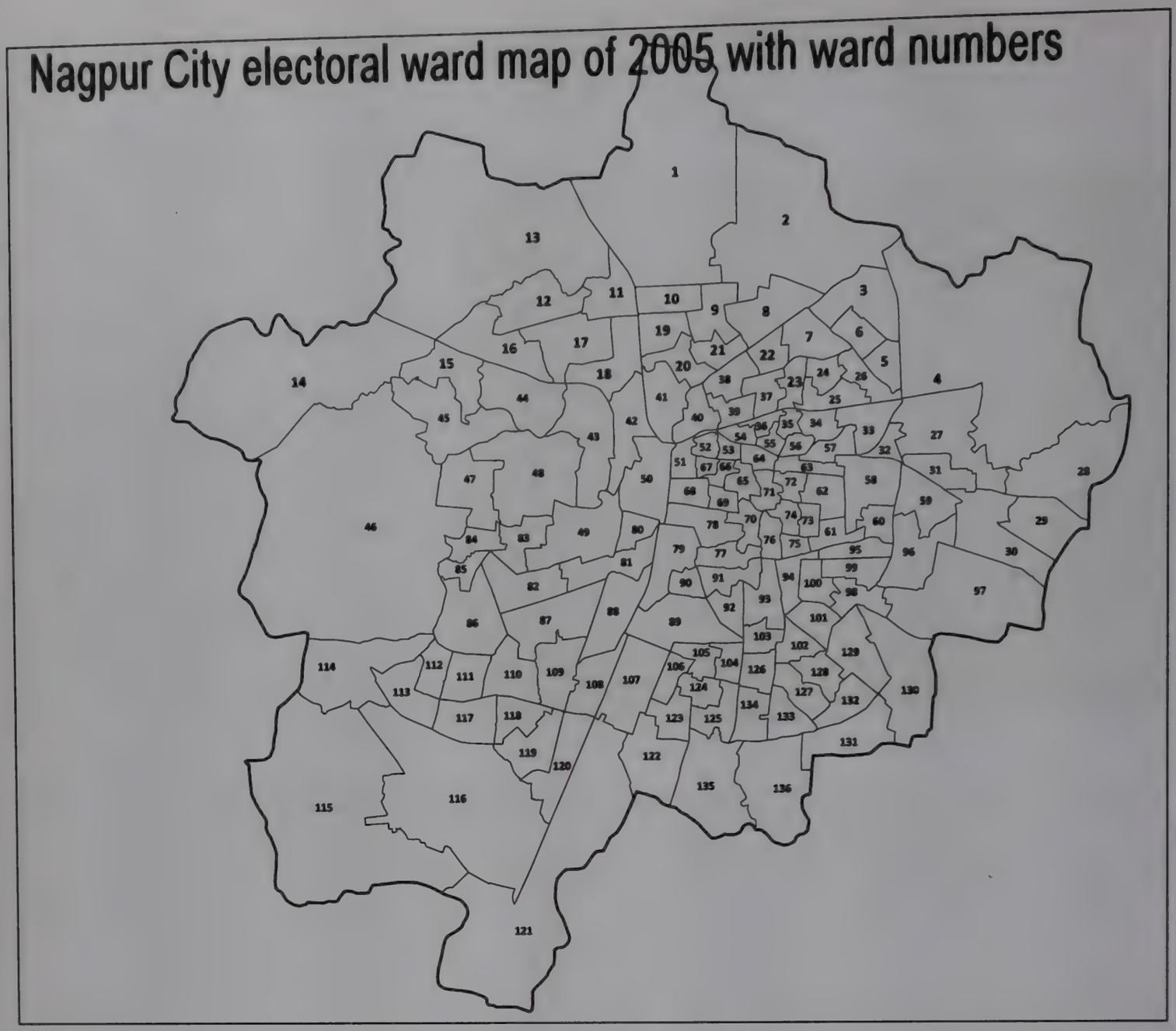
Number of hospitals (class)	0	1-5	6-10	11-15	16-20	21-25
Number of wards	37	47	7	3	3	1



Trend Line showing the growth of Public and Private health Facilities in Solapur

	1991	2001	2010
UHP	13	13	19
PH	12	12	12
Private Facilities	73	145	295




Nagpur City electoral ward map of 2005 with ward numbers

Nagpur Municipal Corporation electoral wards 2005

EW No.	Administration ward name: Zone 1	Public Facilities UHP	Mun. Disp.	MH	PH	Private hospitals By 1991	2001	2010	Population 2001
82	Shanker Nagar					2	3	5	13787
87	Dikshabhoomi					3	11	12	14341
115	Shivangaon								14487
116	Sonegaon								15372
119	Jaiprakash Nagar						2	3	14670
109	Neeri					7	30	39	14150
108	Chuna Bhatti					1	4	6	13938
118	Kamla					1	2	4	13735
120	Somlavada					2	4	8	15844
110	Pratap Nagar					3	9	16	14775
113	Trimurthi Nagar					1	5	9	16430
117	Kalambi Nagar					1	3	8	14054
111	Gopal Nagar						1	2	14147
112	Subash Nagar						2	4	15361
114	Takli								15640
	Total					**21**	**76**	**116**	**220731**

Legend
NMC/government facilities established before/by
A 1991 or before
B by 2001
C by 2010
UHP-Urban Health Post
Disp.-Govt. dispensary
MH-NMC Maternity Hospitals
PH-NMCother government hospitals

Slums: Dipty Signal, Hazari Pahad, Gettikhadan Vinod Bhave Nagar, Chandramani, Surendragad (Main areas)

Nagpur Municipal Corporation electoral wards 2005

EW No.	Administration ward name: Zone 2	Public Facilities UHP	Mun. Disp.	MH	PH	Private hospitals By 1991	2001	2010	Population 2001
44	Seminary Hills								14150
45	Veterinary College								13906
48	Civil Lines					3	3	5	13953
47	Telangkedi					2	2	2	14531
49	Maharajbagh								13966
83	Darmapeth					8	20	27	14135
84	Ramnagar					3	6	7	14479
46	Ambajari	A							15933
85	Hilltop								14924
86	VNIT					3	7	10	14995
	Total	**1**				**19**	**38**	**51**	**144972**

Nagpur Municipal Corporation electoral wards 2005

EW No.	Administration ward name: Zone 3	Public Facilities UHP	Mun. Disp.	MH	PH	Private hospitals By 1991	2001	2010	Population 2001
92	Hanuman Nagar					2	5	8	13979
91	Sirsapeth						1	2	16584
93	Reshambagh	A			A	1	4	5	14853
103	Raghujinagar								15300
134	Ayodhyanagar						5	9	16522
136	Janki Nagar								14972
135	Manewada						1	4	13668
133	New Subhedar Layout							1	16394
125	Gyaneshwar nagar						2	7	16215
104	Bajrang Nagar						1	3	15473
105	Chandramani Nagar								16546
124	Kailash Nagar								15312
	Total	**1**			**1**	**3**	**19**	**39**	**185818**

Nagpur Municipal Corporation electoral wards 2005

EW No.	Administration ward name: Zone 4	Public Facilities UHP	Mun. Disp.	MH	PH	Private hospitals By 1991	2001	2010	Population 2001
77	Karnal Bagh								14154
78	Gandhi Sagar							1	14980
79	Shaniwari					1	1	1	14153
90	Rambagh			A		1	1	2	14448
88	Jailward					1	2	3	14317
80	Sitabardi	A				10	23	29	13996
81	Lendra Park					14	62	106	13995
89	Medical	A			A	3	3	7	15450
106	Kaushalya Nagar	C							16149
121	Narendra Nagar						2	3	16009
122	Jogi Nagar							1	14369
107	Ajni					2	3	5	14564
123	Rameshwari						1	2	15380
	Total	**3**		**1**	**1**	**32**	**98**	**160**	**191964**

Nagpur Municipal Corporation electoral wards 2005

EW No.	Administration ward name: Zone 5	Public Facilities UHP	Mun. Disp.	MH	PH	Private hospitals By 1991	2001	2010	Population 2001
94	Juni Sukrawari					1	7	9	14442
100	Nandanvan	A,C					6	10	14634
101	Nehru Nagar								16262
95	Rahendra Nagar								15150
98	Hasan Bagh						1	2	16127
99	Darshan Colony								15666
102	Sakkardara	A			A	4	12	27	13672
127	Bidpeth	C					2	4	15998
128	Tajabagh							1	14638
126	Navin Subhedar						1	2	14022
129	Ramna Maroti						1	1	14048
131	Mhalgi Nagar							2	16310
130	Digori						2	5	16471
132	Ashirwad Nagar						1	3	14893
	Total	**4**			**1**	**5**	**33**	**66**	**212333**

Nagpur Municipal Corporation electoral wards 2005

EW No.	Administration ward name: Zone 6	Public Facilities UHP	Mun. Disp.	MH	PH	Private hospitals By 1991	2001	2010	Population 2001
51	Boriyapura	A		A	A				14879
52	Bhankeda								16065
53	Timki						1	1	15910
66	Hansapuri					1	1	2	14422
67	Monminpura						1	1	15028
65	Gandhi Bagh	A			A	8	15	20	14410
70	Mahal	A				3	8	12	15560
71	Mahatma Gandhi Ward					1	5	5	15615
68	Bajeriya								15757
69	Baladapura								14766
74	Nawabpura					2	3	5	15067
73	Juni Mangalwari	C						2	14177
75	Chitanvispura						1	1	14718
76	Killa								15750
	Total	**4**		**1**	**2**	**15**	**35**	**49**	**212124**

Civil and Mayo hospitals in ward 51

Nagpur Municipal Corporation electoral wards 2005

EW No.	Administration ward name: Zone 7	Public Facilities UHP	Mun. Disp.	MH	PH	Private hospitals By 1991	2001	2010	Population 2001
24	Binaki								14103
25	Mehendibagh								14490
26	Gamdeep Nagar								14634
33	Kavrapeth						3	3	15863
34	Premnagar								15441
56	Bharatvari					1	2	3	16411
57	Shanthinagar					1	1	1	14348
35	Nayik Talav	C							13891
36	Thandapeth			B		1	1	1	16586
54	Barsenagar						2	2	14097
55	Lendi Talav							2	13685
64	Markasath							2	14826
	Total	**1**		**1**		**3**	**9**	**14**	**178375**

Nagpur Municipal Corporation electoral wards 2005

EW No.	Administration ward name: Zone 8	Public Facilities UHP	Mun. Disp.	MH	PH	Private hospitals By 1991	2001	2010	Population 2001
4	Kalmana								16306
27	Bharat Nagar								15266
28	Punapur								15492
31	Minimata Nagar						1	1	15419
32	Dipti Signal						1	1	16371
58	Harihar Mandir					1	1	1	16537
60	Babulvan						2	2	13975
29	Pardi							3	16035
30	Bhandevadi								14503
59	Vardaman Nagar	C				1	5	9	15302
96	Padole Nagar					1	3	3	16541
97	Vatoda								14929
61	Juna Bagdganj	A				1	1	2	14594
62	Quetta Colony					4	7	16	14639
63	Sathranjipura						1	3	14064
72	Chinteshwar						1	2	15140
	Total	**2**				**8**	**23**	**43**	**245113**

Nagpur Municipal Corporation electoral wards 2005

EW No.	Administration ward name: Zone 9	Public Facilities UHP	Mun. Disp.	MH	PH	Private hospitals By 1991	2001	2010	Population 2001
1	Nara								15763
2	Nari							1	16326
8	Nalanda Nagar	C					1	2	15672
9	Thaware Colony								16200
3	Dhammanand Nagar						1	1	16453
5	Vinoba Bhave Nagar								15660
6	Garib Nawaz Nagar								15252
7	Mehendra Nagar								13631
10	Nagsen Nagar								16131
22	Siddharth Nagar						1	1	14712
23	Panchsheel Nagar								14172
37	Vaishali Nagar								15091
39	Balabhaupeth					1	2	4	14359
21	Chacks Colony						1	2	15681
38	Buddha Nagar					1	3	3	14233
40	Lashkaribagh								16408
	Total	**1**				**2**	**9**	**16**	**245744**

Nagpur Municipal Corporation electoral wards 2005

EW No.	Administration ward name: Zone 10	Public Facilities UHP	Mun. Disp.	MH	PH	Private hospitals By 1991	2001	2010	Population 2001
42	Gaddigodam								14927
41	Mecosabagh					2	2	2	15789
18	Chhaoni					1	7	11	14590
50	Khalasi Lane				A		4	4	15507
43	Sadar					1	7	12	16011
11	Mankapur					1	3	6	14068
12	Jafer Nagar							2	16381
13	Gorewada						1	2	15671
19	Jaripatka	A				3	5	11	14641
20	Indora					5	13	23	16177
14	Dabha	C					1	1	16227
15	Friends Colony	C						1	14203
16	Borgaon								15903
17	Police Line Takli	C					3	5	14797
	Total	**4**			**1**	**13**	**46**	**80**	**214892**

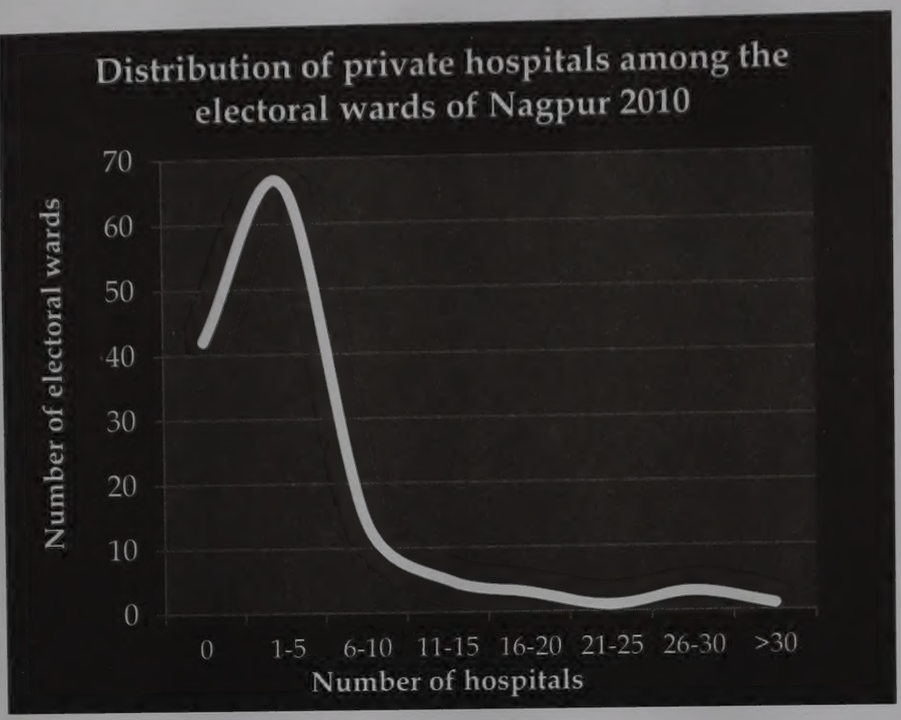
Total Population: 2,052,066

Total registered private hospitals(those located) by 1991=121

By 2001 = 386
By 2010 = 634
(7 hospitals not located, total registered as of June 2010 was 641)

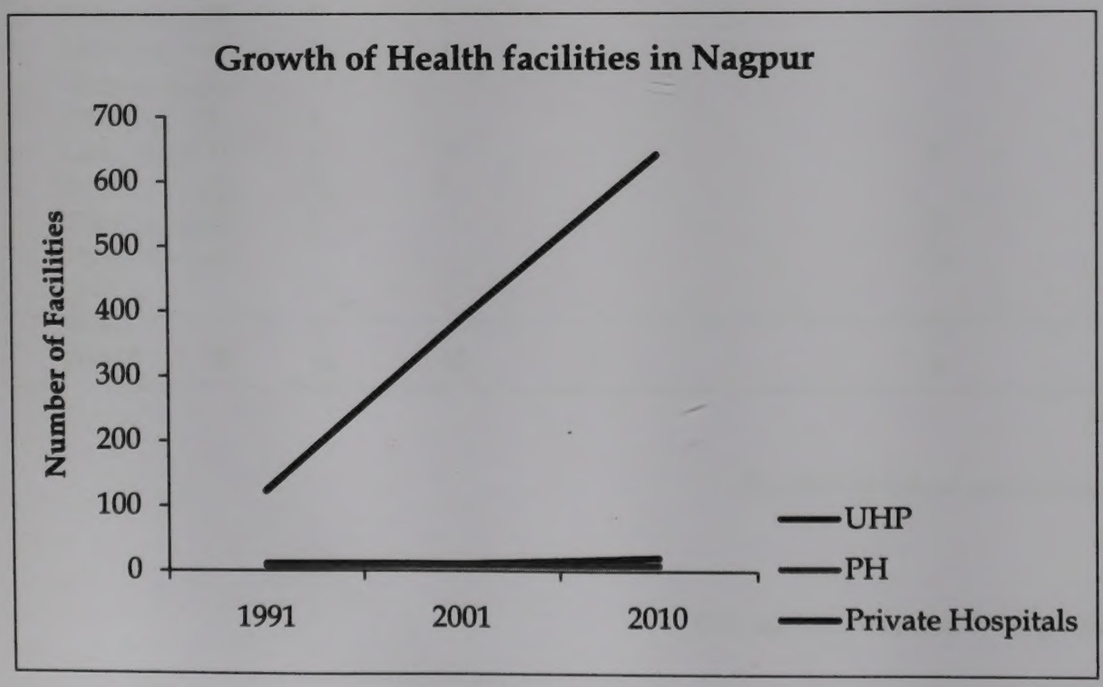
Distribution of Private Facilities among the electoral wards of Nagpur

Number of hospitals (class group)	0	1-5	6-10	11-15	16-20	21-25	26-30	>30
Number of wards	42	66	14	5	3	1	3	1



Trend Line showing the growth of Public and Private health Facilities in Nagpur

	1991	2001	2010
UHP	11	11	21
PH	8	9	9
Private Facilities	123	388	641



Centre for Enquiry Into Health And Allied Themes

CEHAT is the research centre of Anusandhan Trust, conducting research, action, service and advocacy on a variety of public health issues. Socially relevant and rigorous academic health research and action at CEHAT is for the well-being of the disadvantaged masses, for strengthening people's health movements and for realizing the right to health care. CEHAT's objectives are to undertake socially relevant research and advocacy projects on various socio-political aspects of health; establish direct services and programmes to demonstrate how health services can be made accessible equitably and ethically; disseminate information through databases and relevant publications, supported by a well-stocked and specialised library and a documentation centre.

CEHAT's projects are based on its ideological commitments and priorities, and are focused on four broad themes, (1) Health Services and Financing (2) Health Legislation, and Patients' Rights, (3) Women and Health, (4) Investigation and Treatment of Psycho-Social Trauma.

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